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Telephony.

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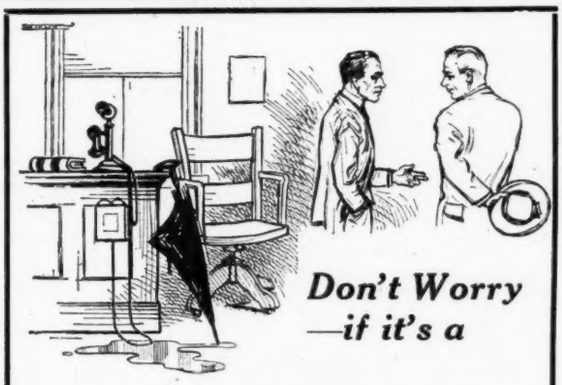

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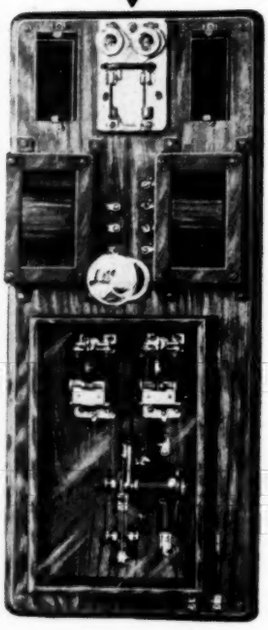

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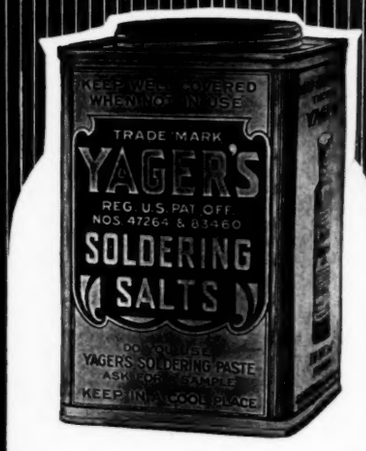

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Telephony.

THE AMERICAN TELEPHONE JOURNAL

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THE OXYGEN OF PUBLIC CONFIDENCE.

We owe a constant report to the public, whose money we are constantly asking for in order to conduct the business itself. Therefore, we have got to trade not only on our efficiency, not only on the service that we render, but on the confidence that we cultivate. There is a new atmosphere for business. The oxygen that the lungs of modern business take in is the oxygen of the public confidence, and if you have not got that, your business is essentially paralyzed and asphyxiated.—Woodrow Wilson.

The Telephone in Business.

Business concerns that have a large telephone trade are coming to realize more and more the importance of having courteous, capable employes take such orders and handle the transactions with customers over the wire. People doing business with a firm over the telephone, are quick to appreciate courteous and intelligent treatment and the fact that they cannot see the representative with whom they are dealing makes the impression received by word of mouth alone all the more lasting.

A pleasant voice on the store or office telephone, taking pains to serve an inquirer, is certainly a valuable asset to any business house. In no way can tact, politeness and a willingness to serve do more to satisfy and please people than when practiced over a telephone wire.

We know of a man who, although passing the place several times a day, transmits his orders to a certain store by the telephone simply because he enjoys hearing the sweet voice of the girl at the other end of the wire. It is not a case of sentiment, either. The man is the middle-aged head of a family and has no essence of the flirt in his system. "That pleasant voice is a cheerful incident in the day's work," said he once, "and to hear it occasionally seems to smooth the creases out of me. No, I don't ever want to see her. It might disillusionize me. She may be a hatchet-face, and that would spoil it all. I am content to hear that voice over the wire."

The remark may sound romantic, but it shows clearly the value of courtesy and kindness manifested over the wire.

A Suggestion to Managers.

Exchange managers can improve telephone service and save considerable complaint by patrons, by emphasizing to those patrons the wisdom of consulting their directory before calling for a number.

The human memory is often uncertain, and many times a subscriber, believing that John Smith's telephone is Main 2943, will ask the operator for that number when the fact is it is really Main 2493 or Main 2934. The brain registers the wrong combination of figures—and the telephone operator usually gets the blame for the failure to raise the right party.

Nearly every one memorizes few or more telephone numbers that he calls frequently, and knows—or thinks he knows—instinctively. Usually he takes down the receiver and the number comes tripping off the tongue, almost without an effort of the brain. Let him pause in hesitation, however, and, such is the elusiveness of numerical combinations, he is likely to stumble mentally and end by having to verify his recollection.

Some subscribers will "take a chance" in the hope that they will get the right connection. Cases are frequent where a patron will repeatedly call the wrong number, believing that "central" is at fault.

The best way, if one is in any doubt, is to consult the directory. It tends to reduce the liability of delay, and time and effort spent in educating subscribers to take this view of it will bear good fruit. The vast percentage of "wrong numbers" is due to subscribers calling from memory.

Factors Tending Towards "The Revival of Business"

One of a Monthly Series of Articles Written with a View of Helping Readers to Think, by Supplying Fundamental Information Rather Than Conclusions—Conditions Contributing to the Golden Opportunity Which the New Year Appears to Offer to This Country

By Frank M. Huston,
Financial Editor, Chicago Evening Post—Editor, Rand McNally Bankers' Monthly.

With our national wealth increasing by leaps and bounds, because of the enhanced returns received on our products due to Europe's needs and with our mills and other manufacturing establishments running in many instances at a percentage of capacity unbelievable a few months ago; with our labor well employed and with wages slowly rising, and with favorable soil conditions for another year's crop, America has every reason to enter a new year happy and full of hope.

Verily, this country has had a golden opportunity thrust upon her by the follies of the warring European nations. This devastating war has so increased Europe's needs and curtailed her productive efforts as to force the consumers across the Atlantic to turn to the United States for succor. Our South and Central American neighbors, who formerly were dependent upon the European markets for many articles that enter into their daily comforts, have also been forced to turn to this market, chiefly because of Europe's necessity of conserving her credit as well as her supply of commodities.

All this is contributing to our golden opportunity. Europe has bought from exporters in the United States this year more lavishly than ever before in history. Our exports in 1915 were close to $4,000,000,000 in value, and, while our imports are again breaking records, the balance of trade in favor of the United States is still greater than ever before experienced. All this means a greatly strengthened banking position in the international financial situation.

Consider in addition to this, the value of our visible created wealth for the year, estimated at close to $12,000,000,000—some of this, of course, figures in our foreign trade—and one finds ample justification for a very considerable feeling of optimism regarding the future.

There is another phase that tends to support this feeling of hopefulness. Enterprise in this country is going ahead. Our energies are being utilized as a creative force, while across the Atlantic a very considerable part of energy of the leading European nations, is being utilized as a destructive force. This is claiming as toll not only billions of dollars of property and created wealth, but millions of men, the very flower of the industrial forces of Europe.

What will happen after the war is a problem of the future. The devastation of Europe, the strained credit conditions there, and the enormous debt saddled upon those countries by the war, for a time at least, must stimulate our markets. Subsequent to that it is quite probable that we will experience serious competition from Europe in the world's markets, for the forces now engaged in war will be compelled to enter a scramble for our gold. But that is too far in the future to be seriously considered at this time and should only be regarded as an inducement for conservative action in making commitments in long time indebtedness.

What we are concerned with at the present time, are the possibilities of the immediate future in the way of trade expansion and the volume of business. This, if properly handled, should be productive of ample profits to safeguard us against the time when Europe will be struggling under an unprecedented load of war obligations and making an effort to rehabilitate herself and re-establish her industries and trade.

The pouring into this country in the last twelve months, of close to $400,000,000 gold, is a substantial credit basis for expansion in business. During the long period of business depression there have accumulated needs which must be filled. Industry is responding to those requirements in a way that is not only reassuring but promises further industrial expansion. Nor is there any basis for fear of a financial stringency in this country for a long time to come. Our Federal Reserve Act has released a very large volume of reserve money that also is now available as a basis of credit. While this is reassuring, it is also a menace at present, for the supply of funds is greater than our needs for actual business. This is apt to be productive of a speculative boom that may in time prove disastrous. It is for this reason that a note of caution is being sounded by our leading bankers against plunging too heavily into debt.

We have further fortified ourselves, through the extension of credit to our foreign customers and in other forms of loans, against the evil effects of forced liquidation by European investors in this country. Such liquidation without this fortification must necessarily unsettle values and disturb business generally. We have been in a position to utilize idle funds and idle credit and have been converting it into loans that will enable us to offset any indebtedness arising out of European selling of American investments. Up to the end of the last year, these loans aggregated approximately $1,000,000,000 which afford us a bulwark against the factor that has disturbed our prosperity on more than one occasion.

There is every reason to look forward to a continuation of the expansion of business activity along conservative lines. The year 1916 appears to hold in store for America a golden opportunity for all businesses.

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The Year Nineteen Fifteen in the Telephone Industry

Annual Survey of Events and Progress in Telephony Indicative of What May be Expected in the Future—Engineering Accomplishments the Feature of Year—Unity Among Independent Men and Other Conditions Strengthen the Industry

By Stanley R. Edwards

Despite the great war which has shaken the entire world, the year 1915 will be recorded in history as one in which most important advances were made in the art of telephony. As one writer puts it, "To future generations it will make little difference just when wireless telephony began to give promise of realization, but ours may well have a thrill of gratification over the fact that conversations between Arlington and Paris have taken place just at this time. Not all thought and all energy in these awful years history will record, were spent in devising and carrying out means of destruction and slaughter. There was a residuum of effort left for better things."

This residuum of effort, applied in the art of telephony, resulted in the accomplishment of, first, commercial transcontinental telephony, and later in showing the practicability of transatlantic and transpacific radio telephony. These achievements, engineers state, leave no question that, were there great funds available for the necessary construction, the human voice could be transmitted successfully around the entire world.

Epoch-Making Events of Year.

The realization of transcontinental telephony and the wonderful demonstrations of the possibilities of wireless telephony by a privately owned and operated telephone company were, of course, the epoch-making events of the year just passed.

There were other events which have a direct influence upon telephonic conditions in this country. The union of the Independent telephone companies, in the last month of the year, into one united national association augurs well for better and more harmonious relations with each other and the further development of an already great industry. The successful negotiations with the Bell company through which the famous qualified toll line agreement has been resolved into a traffic problem, was—from a business standpoint—one of the most important events of the year.

The efforts made by national and state associations and individual companies looking to the improvement of the service through the holding of operators' schools and the employment of service engineers, has laid the foundation for a work that will undoubtedly be productive of extensive increases in the public's use of the telephone. Several important rulings by the high courts, both national and state, and of various state commissions have tended to establish the status of many matters which were in an unsettled state. All of these events have left an influence for better things in the future.

Engineering Developments of Great Moment.

Engineering developments in the art of telephony were by far the most important of any year since the birth of the telephone. The opening of the transcontinental telephone line, giving commercial transmission over a distance of some 3,400 miles, was announced early in the year. It was followed by the opening of lines extending north and south, so that at the present time commercial telephonic communication is possible between points located several thousands of miles apart. Although no details have been given out relative to the apparatus and equipment used to obtain the excellent results in transcontinental telephony, it is quite generally understood that the Pupin loading coil and the audion repeater are largely the responsible factors.

Changes in Economics of Art Presaged.

The combined use of these two will undoubtedly be productive of great changes in the telephone art in the comparatively near future. The extension of the improved long-distance service to places which heretofore have had communication only with other places within a radius of 500 to 1,000 miles, will undoubtedly be continued, so that it will be possible to talk satisfactorily over great distances. In the bringing about of these extensions in the radius of long-distance telephonic communication, the economics of even farm lines and village systems will be affected, for better construction and a high class of equipment will be required.

In late September the world was startled by the announcement that the voice had been sent by wireless from the Atlantic coast to Honolulu, a distance of some 4,900 miles, over land and water. In connection with these tests, wire circuits were used between New York and Arlington, Va., and then connection made with the radio apparatus, which transmitted the voice through the air. It was only a few weeks later that the voice was successfully transmitted across the Atlantic ocean from Arlington to Paris. These successful experiments with radio telephony have brought up the question as to what effect radio telephony will have upon wire telephony.

The answer is that both have distinct fields, and wireless telephony may supplement wire telephony but will not conflict with it. All radio working is subject to many conditions, tending greatly to circumscribe the possibility of an unlimited employment of wireless communication and also the dependable reliability required for successful commercial operation.

Difficulties of Wireless Telephony.

Wireless telephony and telegraphy have to contend with mutual interference, the absence of secrecy, and atmospheric disturbances, all of which tend to confuse and obliterate the signals at the receiving stations. Wireless telegraphy is not as limited in regard to simultaneous messages in a given region as is wireless telephony. While many of the existing difficulties will undoubtedly be re-

duced or eliminated, some of them seem to be inherent to all radio communication, and thus justify the conclusion that the fields of wire and wireless telephony cannot conflict.

Future of Radio Telephony.

With wireless telephony, long-distance communication will be possible some of the time. Short-distance communication will be possible sufficiently for communication with isolated places or things not otherwise to be reached.

A recent statement of President Vail, of the American Telephone & Telegraph Co., says that as soon as the necessary construction and equipment can be assembled, the radius of communication of the company's system will be extended by means of wireless stations and selected points on the coast. These points will be so located as to enable persons and places not able to be connected in any other way, to maintain communication with the world.

The Wireless Apparatus.

Owing to the patent situation, no technical details of the equipment used in the demonstrations of wireless telephony have been given out. It has been reported, however, that the DeForest oscillating audion was used at both transmitting and receiving stations. At the transmitter a bank of large bulbs quite similar in structure to, and embodying the elements and circuits of, the oscillion was employed. These were energized from a common dynamo, their output circuits acting in unison on the common radiating antenna. Other auxiliary audion paths, which were in their turn voice-controlled from a master microphone, controlled this high frequency energy as generated. At the receiving station, the DeForest audion detector and amplifier were used. These were so connected as to first amplify the high frequency currents to approximately 100 times their original intensity and then to transform these into low frequency telephone currents capable of actuating the receivers.

While this apparatus is probably the fundamental basis of the equipment used, some changes have undoubtedly been made by the engineers of the companies concerned in the wireless demonstrations.

Automatic and Semi-Automatic Equipment.

In automatic telephony the advances in the equipment of the Automatic Electric Co. include: Redesign of the trunking switch; rearrangement of private automatic exchange switchboards; automatic battery control; and welded frames.

In connection with the redesign of the trunking switch, the essentials of the selector and connector were thoroughly analyzed. The redesign was carried out with a view to making the mechanism more permanent. The chief improvements are:

The adoption of a cast iron switch frame, insuring permanent adjustment and freedom from warping.

New design or relay, securing greater accessibility and permanence of adjustment.

Dust-proof covers over relays, magnets, and local wiring of each switch.

The new design of private automatic switchboards places the line switches, connector switches, power board and main distributing rack in one case, leaving only the battery outside. All cables and wires enter through conduit.

The automatic battery control includes the automatic charging of the central office battery and automatic regulation of the bus-bar voltage.

Spot welding and oxy-acetylene welding have been applied to switch covers and the iron mounting frames.

The Bell company, it is understood, has made several installations of both automatic, semi-automatic and call distributing systems and is carefully observing the workings of each system. The purpose of these installations is to obtain data upon which to base a decision as to the adoption of semi-automatic or automatic equipment, or to continue installations of manual switchboards provided with auxiliary automatic apparatus for facilitating the handling of traffic.

Manual Switchboards and Equipment.

During the year many operating telephone companies improved their common battery switchboards by adding automatic features, such as automatic recall, disconnect, ringing, secret service, automatic call distribution, operators' control, etc. The new manual switchboards installed were likewise equipped with the automatic features recommended by the various manufacturers.

The improvements in the switchboards of the Bell companies were related to details of apparatus rather than changes in design. In Chicago several large exchanges were opened, necessitated mainly by the demand for service, the total number of subscribers in the Chicago city limits now being well over the 400,000-mark. In the new Hyde Park office, Chicago, was installed the first of the new type of testing desk which has recently been designated as standard for the Bell companies. One of the distinguishing features of this desk is the provision for connecting the troubleman directly to the test desk over test lines, thus permitting of direct testing. The keys of the testing circuits are arranged so that fewer operations are necessary in determining whether a circuit is in an abnormal condition.

Allocation of Service Costs.

Probably the most important activity of the public utilities commissions was that of the Wisconsin Railroad Commission in regard to the allocation of costs for telephone service among the different classes of subscribers.

Early last month the Wisconsin commission handed down a decision in the application for an increase in rates of the St. Croix Telephone Co., of New Richmond, Wis. A slight increase was authorized, based upon a thorough investigation of factors which enter into the cost of telephone service. This investigation was made with the idea of developing principles of cost apportionment to be used in fixing the rates for telephone service.

The assumption was made that until measured service becomes practicable, telephone service will continue to be furnished at flat rates and that it will be impracticable to so adjust charges with any given class of consumers as to distribute to each user his own share of variable expenses. It is possible, however, to determine for each class of user the extent to which the service is used by mans of a traffic study. The cost which should be borne by each class, may therefore be determined, taking into consideration

in deciding upon unit costs, the fact that telephone service is always a service to two consumers.

To determine rates by use of this method, the following data are necessary: A valuation of all properties; a traffic study, and a detailed statement of the expenses of the utility. These factors must all be representative of normal average conditions in the utility.

The costs for service were allocated among the five classes of consumers of the service, viz., residence, business, local rural, foreign rural and toll.

The cost analysis was divided into two parts. The first part involved a direct allocation of the various expenses to each class of service, in accordance with present practice. In the second portion a reapportionment of certain of the allocated groups of expenses of the first apportionment was made from one class of service to another on the basis of use as indicated by the traffic study.

The cost was thus divided as a unit of service between the two consumers responsible for it. The commission considered that the results as determined by the cost analysis were sufficiently accurate to show which classes of rates should be increased and which decreased, although it could not be entirely guided by them, for the traffic study was taken for a relatively short period of time.

Commission Rulings.

Advance payments, deposits, contracts, and rules and regulations of telephone companies received attention from several state commissions. The California, Oregon and Washington commissions made quite extensive investigations into these matters and issued rulings which, in substance, are of the same general character.

California Commission on Deposits and Charges

The California Railroad Commission made an extensive investigation covering a period of ten months, with a view to establishing uniform practices as regards charges, deposits, contracts or guarantees for service, service connections and extensions of water, gas, electric and telephone utilities. The subject matter was considered under four heads; namely, service charges, service connection charges, charges for extensions and modifications of rules. These subjects were divided into 18 sub-sections, and after an exhaustive review of authorities, a table embodying 18 rules was approved by the commission to become effective October 11. Prior to that date, however, a number of petitions for a rehearing were filed. The commission reconsidered and amended several of the rules, the entire set becoming effective December 1.

These rules deal with the amount of deposits and the necessity for them. Under the rules, flat rate customers need pay no deposits if they own the property served, can secure a reasonable guarantor, or have paid their bills promptly during the preceding year. Telephone companies may not discontinue service by reason of non-payment of bills for metered or measured service in cases in which there is a dispute as to the amount of the bill. In case of such a dispute the consumer shall deposit with the commission the amount claimed by the utility to be due, whereupon the commission shall investigate the matter. Failure on the part of the consumer to make such deposit within 15 days after demand by the utility that such deposit be made, shall warrant the utility in disconnecting the service.

Other rules deal with deposits for extending the convenience of sending telegrams and long-distance messages on credit and deposits for securing the construction of an extension to furnish service.

The commission's order requires that the utilities return all deposits heretofore made to guarantee payment of flat rate service and for metered or measured service by customers who have paid their bills promptly during the 12 months prior to the date of the supplemental order, within 30 days after demand All deposits made to guarantee payment for metered or measured service to customers who have paid their bills promptly during a period of service in cases in which the service has lasted less than 12 months shall be returned, provided the customers show ownership of the premises, or offer guarantors satisfactory to the utility. If it is so desired, the company may apply the existing deposit against current bills until it is absorbed.

Deposits in Washington.

The Washington Public Service Commission issued an order in August forbidding the telephone companies in that state to collect deposits from subscribers and requiring the refunding of all deposits then held. In lieu of the deposit, the telephone companies are permitted to collect rentals 10 days after the bill becomes due, in default of which the service may be discontinued. Two months' rental may be collected in advance, according to the order, at the time of ordering service, such charge in no case to exceed $5.

Oregon Ruling as to Advance Payments.

The Oregon Public Service Commission in 1914 instituted an investigation into the rates, charges and regulations of the Pacific Telephone & Telegraph Co. in Oregon. Hearings were held as to the company's regulations and practices relative to advance payments, termination of contracts, deposits of customers and short-term contracts. In late September the commission issued an order permitting the telephone company to require payment in advance for the rendering of unmetered, unmeasured or flat rate service for a period not to exceed that for which the bills are regularly rendered. No other guarantees may be demanded. The conditions under which the company may discontinue service of the kind mentioned are also specified.

To obtain measured or metered exchange service, the applicant must establish his credit before service is delivered, unless a prepayment device makes it unnecessary. The company may not discontinue this service by reason of non-payment of other bills than for the particular service for the current month and service bills immediately prior thereto. The conditions relative to the cash deposit for insuring payment for service of this nature are stated. Other parts of the rules and regulations deal with interexchange or toll service, interest and deposits, contracts, service connections, and extensions.

Other Rulings on Advance Payments.

The Missouri Public Service Commission in its decision in the Columbia case ruled against advance deposits, but

authorized the collection of two months' rental in advance when service is furnished to a new subscriber.

In one of its decisions the Wisconsin Railroad Commission ruled that "the policy of collecting rentals monthly in advance is a legitimate practice which the applicant is authorized to continue." It also permitted the collection of a penalty of 10 cents per telephone if the rentals and tolls are not paid 15 days after due.

Methods of Enforcing Payment of Accounts.

A decision in regard to the methods of enforcing payment of old accounts was rendered about the middle of the year by the United States Supreme Court. The court held that telephone companies are fully within their rights in refusing service to persons in arrears for past service and in not according them the discount usually allowed for payment in advance, this right being secured to them under the 14th amendment of the constitution. This decision of the Supreme Court reversed the Supreme Court of Arkansas.

The Arkansas court ruled that a telephone company, being a public servant, cannot refuse to serve anyone in that capacity in which it has undertaken to serve the public, providing he offers to pay its rates and comply with its reasonable rules and regulations. It cannot refuse to serve him until he pays a debt contracted for service rendered in the past. In line with this decision, many other courts and state commissions ruled that a telephone company must furnish service to those applying for it, regardless of whether or not amounts were owed for past service. This decision of the United States Supreme Court is therefore a most important one as relating to collections.

Rental Charge for Extension Telephones.

A ruling of considerable interest was rendered by the New York Public Service Commission relative to the rate charged for extension telephones. The commission states that the accommodation afforded by an extension telephone cannot be measured in dollars and cents, and all things considered, the service is worth the moderate charge of 50 cents per month made for it. This decision was made as a result of an investigation of all the costs entering into the installation and maintenance of extension sets.

Accuracy of Message Registers.

The question of service meters came up in Massachusetts and New York. In Massachusetts it was claimed that the telephone company's record of measured service calls under existing methods was inaccurate and that the installation of some form of automatic recording device was necessary at the subscriber's station in order to protect subscribers from overcharges. In its decision the commission stated that the margin of error under the company's present recording system was slight and was as likely to favor the subscriber as frequently as the company. It was held that it would not be in the public interest to require that meters be installed for all measured service subscribers, as their cost, whether it be made a separate charge or on a flat rate, must ultimately be borne by the subscribers.

The commission stated that, in its opinion, a meter should be available at a reasonable charge therefor, to any subscriber desiring it, either for the purpose of controlling the unauthorized use of his telephone, or to compare the record made by the meter with the number of messages with which charged. For this purpose, a meter controlled from the central office was stated to be best adapted to the conditions of the metropolitan district of Boston.

A complaint was filed with the New York Public Service Commission, which alleged that the telephone company in New York City had charged for more calls than were made from the telephone. In its dismissal of the complaint, the commission stated that the system of counting calls used by the company as compared with that used by the subscriber is much more accurate. The evidence showed that the percentage of error in the register is considerably less than 1 per cent.

Physical Connection and Toll Message Routing.

In Oregon the question of physical connection between Bell and Independent systems in hotels was again brought up. The Pacific Bell company petitioned the commission to reopen the Oregon Hotel (Portland) case, which was decided in December, 1913. This was refused, the commission, in its opinion, reiterating its position in regard to physical connection or interchange of service between competing companies as relating to hotels. It ordered connection not only for the hotel which had petitioned for it, but for all other hotels in Portland similarly circumstanced with respect to being provided with dual systems.

Decisions of importance to Independent companies were rendered by the Michigan and Oklahoma commissions relative to the routing of toll messages. Both commissions ruled, in effect, that the most direct circuit should be used, regardless of ownership.

Rate Investigations and Settlements.

Throughout the year hearings have been held relative to the valuation of the property of the Chesapeake & Potomac Telephone Co., in Maryland, preparatory to fixing rates. In this valuation the telephone company and the commission have adopted a uniform classification of accounts, uniform definitions of units, uniform arrangements of units, and the placing of all figures in parallel columns. This paralleling is being carried all the way through the work and into the final summaries. By this method, the commission at all times knows exactly what figure each party is using in connection with each item of property and can place its own figure in the final parallel column.

The state-wide investigation of telephone rates by the Pennsylvania Public Service Commission is still open, hearings having been held by the commission, but no action taken. The Colorado Public Utilities Commission ordered a valuation of the property of the Mountain States Telephone & Telegraph Co. in the state, and hearings will be held this month. During the year the Washington Public Service Commission continued the state-wide investigation of the Pacific Telephone & Telegraph Co., which was begun in 1914 with a view to determining the reasonableness of its rates. The first hearing on the investigation will be held at Tacoma, January 24. One of the matters to be considered by the commission is the question of

where toll service commences and exchange service ends.

Important rate cases in which decisions were made during the year were those of New York City and of St. Louis. In the New York City case a joint investigation was made by the New York Public Service Commission and a committee of the legislature. The final schedule agreeable to both these bodies, was accepted by the New York Telephone Co. and the new rates placed in effect July 1. In the St. Louis case, the rates as set forth by the commission, while provisionally adopted by the telephone company, have been protested and a petition filed for a rehearing.

Miscellaneous Commission Activities.

Along the lines of bettering service, the Illinois Public Utilities Commission promulgated a set of rules specifying standards of telephone service, similar to those adopted by the Wisconsin Railroad Commission.

The Wisconsin commission is conducting a most complete survey of the telephone properties in Wisconsin. About 700 of the 1,000 companies operating in that state have been inspected and their lines charted. The chart shows the location of each exchange, line, pole, cross arm, wire, and all other information required in connection with valuation. The data which is thus being assembled and charted, will undoubtedly be of great use and value to the commission and telephone companies.

Orders were issued by various state commissions, including those of California and Idaho, which dealt with the construction methods of telephone and power lines when crossing or in close proximity to each other. The Missouri commission now has under consideration the matter of uniform rules and regulations governing the construction of telephone, telegraph and other electrical signaling wires over the tracks and rights of way of railroad companies in the state. The United States Bureau of Standards is also interested in this work. It has sought the co-operation of all wire-using companies in an effort to formulate a standard set of safety rules, with a view to their adoption by all the state commissions.

Public Utility Laws Enacted.

During the year public utility acts were passed by the Minnesota and Wyoming legislatures. In Iowa, Texas and Utah public utility bills were considered, but laws were not enacted. There are now but five states in which telephone companies are not under supervision of commissions; namely, Arkansas, Delaware, Iowa, Texas and Utah.

Status of Mutual Telephone Companies.

In two states the question of mutual companies was passed upon by the supreme courts. In Ohio the supreme court held that all telephone companies, whether operating for profit or not, require a certificate of necessity for the public convenience before they may exercise the right of franchise of owning and operating a plant for the furnishing of telephone service in a municipality or locality where there is already in operation a telephone company furnishing adequate service.

In Illinois the supreme court ruled upon the status of the Noble Mutual Telephone Co. in regard to its relation to the public utilities commission. The Noble company is not a commercial company organized for profit. It renders service to its members at cost, and does not hold itself out to render service to anyone except members. It connects only with other companies on the basis of mutual exchange of free service. No charge is made for connecting any member with a toll line, and the company collects no tolls, leaving the matter of toll charges to be settled with the member seeking such service and the toll company rendering it. By the terms of its franchise the service of the Noble company is open to any one who may demand it and is willing to pay the price stated in its constitution and by-laws.

Mutual Companies in Illinois.

The court held it is not necessary, in order to constitute a public use, that the company's service should be extended to the whole world or to include whoever might happen to be temporarily in Noble or in that vicinity. Based upon the facts relating to the obtaining of service from the mutual company, the court decided that the company is a public utility, as that term is defined under the Illinois public utilities act.

In another decision the Illinois Supreme Court held that the fact that a telephone company has obtained a franchise to string its wires along the streets of a city or village does not necessarily make it a public utility under the meaning of the Illinois public utilities act.

Public Use and Nature of a Mutual Corporation.

This opinion is based upon the reasoning that the term "public utility" implies public use. This carries with it the duty to serve the public and to treat all persons alike, without discrimination, and precludes the idea of service which is private in its nature, whether for the benefit and advantage of a few or of many. The question of the nature of a corporation cannot depend upon the number of persons engaged in the enterprise for their mutual benefit, but the nature of a corporation and the purpose for which it is organized must be ascertained by reference to its charter.

By its charter the use of the telephone system involved in this particular case is limited strictly and solely to the members of the corporation. It has no authority under its charter to erect or maintain any telephone lines for the service of the public. It can only exercise such powers as are within the scope of its charter, and no others. In the case of the Noble Mutual Telephone Co. its lines connected with exchanges in other counties, and it obtained and enjoyed a license on condition that no person should be barred from membership and use of its lines.

In another case the mutual company had a central station connecting with various county lines and with the local village system and long-distance lines. The object of the corporation, as stated in its application for incorporation, was for "telephone purposes and to legally establish our rights on public and private property with poles, wires and necessary equipment," all of which denoted an unlimited public use.

The effect of the last mentioned Illinois ruling seems to

indicate that the wording of a mutual company's charter is the determining factor as to whether or not the company comes under the classification of a public utility.

Valuation Activity of Interstate Commission.

Activities of the Interstate Commerce Commission were mainly centered in Valuation Order No. 18. This order, which was issued in June, called for the filing by every Class A and B company whose property is to be valued under the valuation act of March 1, 1913, of a schedule, on or before September 30, 1915, showing the purchases of new material made and net prices paid for such purchases and the rates of compensation paid employes during the five years beginning January 1, 1910.

It was found that the amount of work involved on the part of the companies was such that only a few were able to comply with the order in the time specified, and many asked for an extension of time. After making a thorough investigation the Interstate Commerce Commission extended the time, giving the companies six months longer within which to report, and including the year 1915 in the returns.

Early in August a valuation comittee was appointed to represent the telephone companies before the Interstate Commerce Commission and officials of the various state commissions in connection with valuation proceedings. This committee was composed of representatives from the Bell company, the National Independent Telephone Association and the Independent Telephone Association of America. Several conferences were held at which questions relating to valuation were discussed.

The Joint Accounting Committees.

In August a joint accounting committee was formed, composed of representatives of the two national associations. This joint committee designated delegates to represent the Independent telephone companies on another joint committee consisting of representatives of both Independent and Bell companies. Much valuable work has been accomplished by both of these accounting committees in connection with the revision of the forms of the annual reports required by, and in relation to amendments to the uniform system of accounts prescribed by the Interstate Commerce Commission.

Representatives of the Interstate Commerce Commission have visited practically all of the Class A companies and a number of the smaller companies in order to obtain at first hand information relative to actual conditions.

Purpose of I. C. C. Statistics.

The Interstate Commerce Commission also sent out circular No. 14, which went to all telephone companies and associations regularly engaged in the telephone business. This circular contained questions relative to the nature of the organization, whether it does a commercial business, the number of central offices, subscribers, miles of pole line and miles of wire, and also whether connections might be arranged so that persons may talk with any person in a different state. Other questions asked for a statement of the total revenues received for the year ending December 31, 1914, from telephone service, the total amount received from commissions or allowances on long distance business, and also the total expense for that year.

The real purpose of this circular is to provide the commission with data for a complete classification of all operating telephone companies.

Work of Associations.

In connection with the valuation work in Ohio the committee on valuation of the Ohio Independent Telephone Association issued a book giving unit costs for telephone materials and supplies. These unit costs have proved of great aid to those Ohio companies that have had to make valuations of their plants in connection with applications for rate increases.

The "Service First" slogan was taken up by many telephone companies and several state associations. This interest in the development of service resulted in the issuing of a set of long-distance operating rules by the Ohio State Telephone Co. These rules, the most complete issued on the subject of toll operating, have been adopted by the Western Pennsylvania and other state associations and a number of companies. Following their adoption, many schools for operators were held, and a great improvement in service has resulted.

Schools for Operators.

In this connection, mention should be made of the operating schools conducted by W. S. Vivian, under the auspices of the Independent Telephone Association of America. Mr. Vivian conducted some 30 schools, which were attended by about 4,000 operators, the great majority of whom had never before received instructions relative to efficient operating methods.

Several state associations during the year employed traveling chief operators to visit the exchanges of member companies and make suggestions, with a view to correcting faulty operating methods. The results from the employment of these traveling chief operators have been so beneficial that other associations have adopted or are considering the adoption of the plan.

Results of Service or Inspection Work.

Along the lines of "Service First," astonishing results from a work much more important than operating schools, in the minds of many practical telephone men, were accomplished by the two Pennsylvania associations. The Western Pennsylvania Independent Telephone Association, over a year ago, employed a service engineer or inspector to visit the various exchanges of the members and make thorough inspections of lines and equipment. Suggestions were then made relative to changes for improving transmission, which could be made at a nominal cost.

The pioneer work done in Pennsylvania along these lines showed, in the case of Pittsburgh alone, after a year's work, an increased commercial transmission area of just double what it was when the work was begun. The results in other districts also showed that transmission conditions can be materially changed for furnishing a higher grade of service at very little expense.

Those who have made a study of the conditions which prevail in exchanges in other parts of the country contend

that this service work should be taken up by the national and state associations in preference to operating schools. The argument advanced for this is that with poor transmission the best of operating methods fail, as the operators become discouraged and will not observe the rules, once they know what good service really is.

During the coming year, great advances will undoubtedly be made towards better transmission conditions of plant and equipment. After these changes will follow the desire and, indeed, the necessity for uniform methods of operating.

One Strong National Association.

Undoubtedly the most important event from the standpoint of the Independent telephone manager, was the uniting of the two national associations into one strong organization. With the one strong national association intercompany relations may be expected to be greatly strengthened and the industry correspondingly made a better business than ever. The matter of public relations will also be affected beneficially through this union of the Independent forces.

Relations with the public received greater attention in 1915 than in previous years. The managers of the various companies took hold of the idea that they should be leaders of thought in their communities and take an active part in the guidance of public sentiment. The effect of these efforts has plainly indicated that the manager can do his organization and community a great service in this way.

The Qualified Toll Line Contract.

One of the factors which has had a retarding influence upon the building up of the telephone industry as a whole, has been the lack of suitable toll connections. This obstacle to the general development of telephony as an industry, seems now in a fair way to be removed, as a basis satisfactory to those companies concerned has been agreed upon. This agreement resulted from a series of negotiations extending over a period of two years and was finally decided upon in the last month of the year. The final solution of this problem of toll connections in a manner satisfactory to the parties involved, will undoubtedly be of vast importance to the entire industry, viewed from a business standpoint.

Mergers and Consolidations.

While the first impression is that there were a great many mergers and consolidations during the year, in reality there were comparatively few when an attempt is made to count them. All of the mergers were in accordance with the agreement which the Bell company made some two years ago with the Department of Justice. In many cases the mergers were made for the purpose of a division of territory, one company withdrawing from a certain section where its business was not flourishing and the other company abandoning another section to the first company. In this way both companies do business in a territory in which they are strongest and are thus enabled to operate more profitably.

Interest in Advertising.

The matter of advertising and publicity was given increased attention by the Independent telephone companies. Many of the companies experimented with various forms of advertising and became thoroughly convinced that "advertising pays." In connection with the opening of the transcontinental telephone line, mention should be made of the methods used to acquaint the public with the excellent transmission results attained. All during the Panama-Pacific International Exposition, at San Francisco, demonstrations were daily given to thousands of people whose homes are located in various parts of the country. In addition to these demonstrations, members of business organizations located in many of the principal cities of the country were afforded an opportunity to listen and talk over the line. By these methods thousands of people have been thoroughly convinced of the practicability of long distance telephone communication and all telephone service consequently given good publicity.

Earnings and Construction Work.

Although 1915 was not generally regarded as a good business year, operating telephone companies did a good business. There was a normal increase in both local and toll departments and earnings were as large and, in many cases, greater than in former years. In no localities were there any serious setbacks.

Last year the Bell companies spent only about half of the amount usually expended on construction, but the Independent companies built a number of new plants and installed new equipment. There was considerable underground work done and plants otherwise placed in good condition for the handling of increased business and the providing of better service.

The War and Prices of Materials.

The manufacturers, especially during the latter part of the year, did a good business. Owing to the war, the prices of raw materials entering into telephone sets and switchboards has greatly increased. In the case of telephone sets, the cost has advanced between 60 and 75 cents for each set.

These increased costs are due, not to imported materials, but to the great demand for steel, copper, brass, zinc, etc., the prices of which have been advanced in some cases 100 per cent., owing to the demand caused by the war. As yet the increased manufacturing costs of telephone apparatus and equipment have not been reflected in the sales prices, but the continuance of the war is quite certain to result in prices of equipment to the operating companies being raised. Already prices have been advanced in the cases of copper and iron wire, dry cells and other allied materials.

Apparatus Improvements and New Designs.

There were many improvements made by the various manufacturers in receiver and transmitter construction, keys and other telephone equipment. For use on shipboard, an all metal switchboard was designed.

There was an increased demand for intercommunicating telephone systems in apartment houses and the larger types of residences. Resulting from the increased interest in this style of telephone instruments, there were a number of improvements made in the apparatus.

A new type of hand telephone set, for use in forest service patrol work, was developed by one of the manufacturers in collaboration with the United States Forest Service. The

set, which is a local battery instrument, weighs only 3¾ lbs., the light weight being obtained by the omission of the hand generator. An interrupter mechanism is provided for signaling purposes. It operates a howler connected at the terminal stations, in addition to the regular bells of the stationary telephone.

During the year Thomas A. Edison announced the perfection of the telescribe, a combination of the telephone and phonograph. To use the telescribe, two receivers are essential, one being used by the person holding the conversation and the other fitted to the arm of a dictating phonograph. A record of what both persons say is made at each end of the line. Where the person desired is not able to come to the telephone, a message may be received upon the phonograph and read at leisure by the desired party.

New Uses of Telephone.

In the conduct of the great war, the telephone has been found indispensable. Not only has it been used to keep the different divisions of the armies in close touch, enabling them to act in unison, but for directing the fire of the great guns as well. The use of the telephone for destructive purposes, however, is in a way compensated by its utilization in assisting surgeons to locate bullets in the bodies of wounded soldiers.

The telephone is playing an increasingly greater part in big construction work. A late instance of this was in the building of a bridge across Hell Gate, as that part of East River between Ward's Island and Long Island, New York, is called. This bridge was necessary as part of a new route for the New York, New Haven & Hartford Railroad in entering New York City. The work was started in January last and all the year the telephone was active in assisting the carrying on of the construction. The crowning use of the telephone on this work took place in October, when the two steel arms, one extending from each bank of the river, were joined above mid-river. The last girder had to be swung into place and the steel arms projecting from either side, lowered by means of four gigantic hydraulic jacks.

There was thus the delicate task of guiding the joining girder into place and lowering each steel arm so that the entire structure would come into alignment. This was accomplished by means of orders issued from the foreman located at the top girder to the men operating the hydraulic jacks, the erecters, and the riveting machines. It was indeed a delicate job, for if one side of the span had been lowered too quickly or if a jam had occurred, the entire structure, containing some $12,000,000 in steel, might have been precipitated into the river. But everything was successfully accomplished with the aid of the telephone.

Another use to which the telephone was placed during the year was in connection with show-window demonstrations. A pair of loud-speaking receivers was placed outside of the show-window and the demonstrator in the window talked into a special transmitter, his voice being reproduced in a louder degree outside of the window. Loud-speaking receivers were installed during the year on many lines of important railway systems, where they are doing efficient work.

Relations With Employes.

Several of the Bell companies during the year encouraged the carrying on of what might be termed "employes' activities." That is, if a group of employes organized a club, the company would sanction it by providing quarters for meeting and otherwise giving its approval. Along this line might be mentioned the shooting club of the Chicago Telephone Co., the gallery for which is located in one of the company's buildings; debating clubs, orchestras, bands, glee clubs, and other organizations in which employes exhibited an interest. These various activities are carried on by the employes, the company having no interest in them beyond providing a place for meeting. The company benefits from such organizations indirectly in that employes are provided with good, clean amusement in suitable surroundings and a spirit of good feeling engendered toward the company and its work.

Along the line of education, the telephone study clubs, plant schools and correspondence courses for toll operators may be mentioned. A number of these were started during the last year among the Bell companies. They are all along the idea of giving the employe every opportunity possible to learn the particular part of the business in which he is most interested, thus making him a more valuable employe and increasing his earning capacity.

"Safety First" has also been featured among the employes of many companies. This movement has resulted in a great reduction in accidents preventable by ordinary prudence in the performance of work. Along the line of "Safety First" might also be mentioned the "standards of electrical construction and operation" which were considered by the Industrial Commission of Wisconsin and the Wisconsin Railroad Commission at hearings held the latter part of October.

Opportunities to purchase shares of stock under special conditions were extended to employes of a number of Independent companies. This stock was offered on easy terms of payment and at a price considerably below the market value. Advantage was taken of these opportunities by a great number of the employes of the various companies. The results of this plan have been beneficial to the companies in increased interest and loyalty.

The employe's insurance and pension fund, established two years ago by the Bell companies, expended practically $2,000,000, which went to employes or their families on account of sickness, accidents and death. The epidemic of colds now prevalent in Chicago has caused a depletion in the forces of the Chicago Telephone Co. to the number of some 500 persons. These, through the operation of this fund, will not lose any of their pay while absent from duty.

Convention of Sixth District Missouri Association.

The annual convention of the Sixth District of Missouri Independent Telephone Association will be held at Hotel Terry, Sedalia, Mo., January 26, 1916. An operating school will be one of the features and the telephone companies in that district are urged to send their chief operators or as many operators as they can spare for one day. A return postal card is being mailed to each member company asking for suggestions for discussion at the meeting.

Service Cost of Telephones Described by Commission

Epochal Decision of Wisconsin Railroad Commission Relative to Costs for Different Classes of Telephone Service—In Application of St. Croix Telephone Co. for Rate Increase, Cost of Service Is Allocated to Each Class of Subscriber—Third Installment

SECOND APPORTIONMENT OF EXPENSE.

The second apportionment of expense, previously outlined, reapportions certain of the allocated expenses of the "First apportionment" among the various classes of service on the basis of use, as determined by the traffic study.

By referring to Table No. 9 it will be noted that the items of expense occurring in Group No. 1 are central office operators' salaries and commercial expense. It will be remembered that the first apportionment of central office operators' salaries apportioned this item between Toll and New Richmond on the basis of actual time spent by the operators at the toll or at the local switchboards. This apportionment, however, does not divide up among the classes of local service the portion which has been charged to New Richmond.

It appears that the most logical basis which we have at our disposal for this division, or apportionment, is that of the actual *use* which each of the classes of service makes of the facility to which this expense is incident, viz., the operators' time. We shall therefore attempt to obtain, by the use of the traffic study, and terminating calls. These percentages represent the portion of the operators' time chargeable to each class of service.

It will be noted that the class totals for each of the last three classes of service, viz., "Operator," "Ring backs" and "Business-residence" are added back into the other classes of service —the first two classes to the classes of service originating or terminating the call—and that the last call, "Business-residence," is divided between the "Business and Residence" classes on the basis of the average calls per telephone to and from all residence telephones compared with the average calls per telephone to and from all business telephones. This operation is carried out just below the main portion of the table.

We wish also to call attention to the fact that by adding the terminating to the originating calls for each class and finding the percentages which each of these class totals is of the grand total, originating and terminating, the cost of the call is divided 50 per cent. to the class which is the originator of the call and 50 per cent. to the class which is called. This principle, in special cases, will undoubtedly be open to question, but

Calls From These Classes:	Calls to These Classes: Residence			Business			St. Croix Rural			Foreign Rural			Toll			Operators			Ring backs			Business-Residence			Total Terminating Weighted Calls
	No. Calls	Coefficient	Total	No. Calls	Coefficient	Total	No. Calls	Coefficient	Total	No. Calls	Coefficient	Total	No. Calls	Coefficient	Total	No. Calls	Coefficient	Total	No. Calls	Coefficient	Total	No. Calls	Coefficient	Total	
Residence	611	1.00	611	454	1.00	454	139	1.30	181	167	1.40	234	50	1.00	50	59	1.00	59	85	.25	21	51	1.00	51	1,661
Business	257	1.00	257	201	1.00	201	84	1.30	109	119	1.40	167	51	1.00	51	26	1.00	26	23	.25	6	23	1.00	23	840
St. Croix rural	115	1.03	118	77	1.03	79	235	1.32	310	143	1.42	203	22	1.03	27	52	1.05	54	460	.25	115	8	1.03	8	914
Foreign rural	160	1.07	171	116	1.07	124	118	1.36	160	461	1.45	668	34	1.07	36	43	1.07	46	1,030	.25	258	27	1.07	29	1,492
Toll	23	1.00	23	11	1.00	11	4	1.30	5	9	1.40	12	....	.....	.....	....	.....	.....	.....	.....	.....	2	1.00	2	53
Operator	2	1.00	2	1	1.00	1	8	1.30	10	5	1.40	7	....	.....	.....	....	.....	.....	.....	.....	.....	....	.....	.....	20
Ring backs—Business-residence	38	1.00	38	11	1.00	11	5	1.30	6	10	1.40	14	1	1.00	1	3	1.00	3	14	.25	4	7	1.00	7	84
Total—																									
Weighted originating calls	1,220	.....	.....	881	.....	.....	781			1,305			165			188			404			120		
Weighted terminating calls	1,661	.....	.....	840	.....	.....	914			1,492			53			20			.....			84		
	2,881	.....	.....	1,721	.....	.....	1,695			2,797			218			208			404			204		
Ring backs	21	.....	.....	6	.....	.....	115			258			.....			.....			.....			.....		
	(59	.....	.....	(26	.....	.....	(54			(46			.....			.....			.....			.....		
Operator	(2	.....	.....	(1	.....	.....	(10			(7			.....			.....			.....			.....		
Business-residence	72	.....	.....	139	.....	.....	.....			.....			.....			.....			.....			.....		
Totals	3,035	.....	.....	1,893	.....	.....	1,874			3,108			218			.....			.....			.....		10,128
Percentages	30.0			18.7			18.5			30.6			2.2			.....			.....			.....		.....

Table 10. Table Showing Traffic Between Various Classes of Service, Coefficients and Weighted Calls.

the actual percentage of local operators' time devoted to each class of service. It should be noted that all toll calls to and from New Richmond, besides being handled at the toll switchboard, must also pass through the local board and receive the attention of local operators. Hence the following apportionment will charge to the toll class of service a portion of the *local* operators' time.

Table No. 10 is a summary of a 24-hour traffic study taken at the New Richmond exchange.

This summary (Table No. 10) shows the number of calls from each class of service to every other class of service; applies a "weighting factor" or "coefficient" to each call which takes into account the greater amount of time required by the operator to handle certain classes of calls than to handle others; adds the total weighted terminating calls to the total weighted originating calls for each class and obtains the percentage which this class total is of the grand total of both originating for the purposes of this case, taking into consideration the character of the classes of service which we find, we believe that it is a reasonable principle to follow.

The following table shows the apportionment upon the foregoing basis of the $1,516.29 charged in the first apportionment to "New Richmond." It is a summary of apportionment of "Local Central Office Operators' Salaries" to classes of service.

Total amount of central office operating labor charged in the first apportionment to "New Richmond," amounting to $1,516.29, is as follows:

Class of Service.	Percentages Based on Weighted Calls.	Amount to Class.
Residence	30.0	$ 454.89
Business	18.7	283.55
St. Croix rural	18.5	280.51
Foreign rural	30.6	463.98
Toll	2.2	33.36
Total	100.0	$1,516.29

This apportions 2.2 per cent. of $1,516.29 or $33.36 to "Toll." Adding $33.36 to $748.60, the amount charged to toll in the first apportionment, gives a total of operators' salaries chargeable to "Toll," of $781.96.

The other expense item falling in Group No. 1 is commercial expense. (See First Apportionment Summary, Table No. 9.) Inasmuch as this expense does not depend upon any inter-relation of traffic among the subscribers, it seems logical not to extend its apportionments further than the first apportionment or the *allocation*. Therefore, the item "commercial expense," will appear in the final summary of the second apportionment exactly as it appears in the final summary of first apportionment.

GROUPS NOS. 2 AND 3.

Again referring to the final summary of the first apportionment, Table No. 9, it will be noted that expense groups Nos. 2 and 3 comprise, in general, central office maintenance expenses, wire plant expenses and substation expenses, including

RESIDENCE EXP

GROUP II APPORTIONMENT.

Traffic Data.

Total Group II Residence Expense = $1,481.

Traffic Between Residence and	Originating	Terminating	Total Calls	Total Residence Message Line Units	*Add Back to Proper Classes	Total Residence Message Line Units (revised)	Residence	Total Residence Message Line Units Divided Among Classes of Service: Business	St. Croix Rural	Foreign Rural	Toll
Residence	611	611	611	1,222	176	1,398	1,398	.....	.....	.....	.....
Business	454	257	711	711	59	770	385	385	.....	.....	.....
St. Croix rural	139	115	254	254	.....	254	127	.....	127	.....	.....
Foreign rural	167	160	327	327	.....	327	163.5	.....	.....	163.5	.....
Toll	50	23	73	73	.....	73	.....	.....	.....	.....	73
Operator	59	2	61	*61							
Ring backs	85	85	85	*85	.....	2,822	2,073.5	385	127	163.5	73
Business-residence	51	38	89	*89	.....	100%	73.45%	13.63%	4.5%	5.8%	2.6%
Apportionment of Group II Residence Expense						$1,481.00	$1,087.79	$202.16	$ 66.64	$ 85.90	$38.51

BUSINESS EXPE

Total Group II Business Expense = $301.71.

Traffic Between Business and	Originating	Terminating	Total Calls	Total Business Message Line Units	*Add Back to Proper Classes	Total Business Message Line Units (revised)	Residence	Total Business Message Line Units Divided Among Classes of Service: Business	St. Croix Rural	Foreign Rural	Toll
Residence	257	454	711	711	11	722	361	361	.....	.....	.....
Business	201	201	201	402	73	475	.....	475	.....	.....	.....
St. Croix rural	84	77	161	161	.....	161	.....	80.5	80.5	.....	.....
Foreign rural	119	116	235	235	.....	235	.....	117.5	.....	117.5	.....
Toll	51	11	62	62	.....	62	.....	.....	.....	.....	62
Operator	26	1	27	*27							
Ring backs	23	23	23	*23	.....	1,655	361	1,034	80.5	117.5	62
Business-residence	23	11	34	*34	.....	100%	21.81%	62.48%	4.86%	7.10%	3.75%
Apportionment of Group II Business Expense						$301.71	$ 65.80	$188.52	$ 14.66	$ 21.42	$11.31

ST. CROIX RURAL E

Total St. Croix Rural Group II Expense = $1,537.60.

Traffic Between St. Croix Rural and	Originating	Terminating	Total Calls	Total St. Croix Rural Message Line Units	*Add Back to Proper Classes	Total St. Croix Rural Message Line Units (revised)	Residence	Total St. Croix Rural Message Line Units Divided Among Classes of Service: Business	St. Croix Rural	Foreign Rural	Toll
Residence	115	139	254	254	4	258	129.0	.....	129.0	.....	.....
Business	77	84	161	161	9	170	.....	85	85.0	.....	.....
St. Croix rural	235	235	235	470	520	990	.....	.....	990.0	.....	.....
Foreign rural	143	118	261	261	.....	261	.....	.....	130.5	130.5	.....
Toll	22	4	26	26	.....	26	.....	.....	.....	.....	26
Operator	52	8	60	*60							
Ring backs	460	460	460	*460	.....	1,705	129.0	85	1,334.5	130.5	26
Business-residence	8	5	13	*13	.....	100%	7.57%	4.99%	78.27%	7.65%	1.52%
Apportionment of St. Croix Rural Group II Expense						$1,537.60	$116.40	$ 76.73	$1,203.47	$117.63	$23.37

FOREIGN RURAL EN

Traffic Between Foreign Rural and	Originating	Terminating	Total Calls	Total Foreign Rural Message Line Units	*Add Back to Proper Classes	Total Foreign Rural Message Line Units (revised)	Residence	Total Foreign Rural Message Line Units Divided Among Classes of Service: Business	St. Croix Rural	Foreign Rural	Toll
Residence	160	167	327	327	12	339	169.5	.....	.....	169.5	.....
Business	116	119	335	335	25	360	.....	180.0	.....	180.0	.....
St. Croix rural	118	143	261	261	.....	261	.....	.....	130.5	130.5	.....
Foreign rural	461	461	461	922	48	970	.....	.....	.....	970.0	.....
Toll	34	9	43	43	.....	43	.....	.....	.....	.....	43
Operator	43	5	48	*48							
Ring backs	1,030	1,030	1,030	.....	.....	1,973.0	169.5	180.0	130.5	1,450.0	43
Business-residence	27	10	37	*37	.....	100%	8.6%	9.1%	6.6%	73.5%	2.2%
Apportionment of Foreign Rural Group II Expense						$224.51	$ 19.31	$ 20.43	$ 14.82	$165.01	$ 4.94

	Total	Residence	Business	St. Croix Rural	Foreign Rural	Toll
Total Group II	$3,544.82	$1,289.30	$487.84	$1,299.59	$389.96	$ 78.13
Amount charged to toll in first apportionment						160.21
Total Toll						$238.34

Table No. 11. Second Apportionm

interest and depreciation on the various classes of property. When a subscriber of one class calls a subscriber of any other class, he utilizes the equipment of that subscriber to which all of these expenses are directly incident. It therefore seems but logical to reapportion the total of these expenses among the various classes of users on the basis of use as indicated by the traffic study.

In order to avoid confusion in the use of the traffic study in the apportionment of the Group No. 2, in which are principally wire plant expenses, and the Group No. 3, in which are substation expenses, we find it advantageous to employ a different *unit of use* in the apportionment of each group. The first of these units is the "message line." Since it relates primarily to the use of the wire plant, it will be employed in the apportionment of the Group No. 2 expense. The second unit is the "message telephone." Similarly, since it relates primarily to the use of the substation equipment, it will be employed in the Group No. 3 apportionment.

XPE APPORTIONMENT.

GROUP III APPORTIONMENT.

Total Group III Residence Expense = $1,018.69.

Classes of Service (repeated)	Total Residence Message Telephone Units	*Add Back to Proper Classes	Total Residence Message Telephone Units (revised)	Total Residence Message Telephone Units Divided Among Classes of Service: Residence	Business	St. Croix Rural	Foreign Rural	Toll
Residence	1,222	261	1,483	1.483	.....	.....	.....	.....
Business	711	59	770	385	385.0	.....	.....	.....
St. Croix rural	254	.....	254	127	.....	127.0	.....	.....
Foreign rural	327	.....	327	163.5	.....	.....	163.5	.....
Toll	73	.....	73	.....	.....	.....	.....	73.0
Operator	*61	.....	2,907	2,158.5	385.0	127.0	163.5	73.0
Ring backs	*170	.....	100%	74.25%	13.25%	4.35%	5.65%	2.5%
Business-residence	*89	.....	.....					
Apportionment of Group III Residence Expense			$1,018.69	$ 756.38	$134.98	$ 44.30	$ 57.56	$ 25.47

PE APPORTIONMENT.

Total Group III Business Expense = $302.83.

Classes of Service (repeated)	Total Business Message Telephone Units	*Add Back to Proper Classes	Total Business Message Telephone Units (revised)	Total Business Message Telephone Units Divided Among Classes of Service: Residence	Business	St. Croix Rural	Foreign Rural	Toll
Residence	711	11	722	361.0	361.0	.....	.....	.....
Business	402	96	498	.....	498.0	.....	.....	.....
St. Croix rural	161	.....	161	.....	80.5	80.5	.....	.....
Foreign rural	235	.....	235	.....	117.5	.....	117.5	.....
Toll	62	.....	62	.....	.....	.....	.....	62
Operator	*27	.....		361.0	1.057.0	80.5	117.5	62
Ring backs	*46	.....	1,678	21.51%	63%	4.8%	7%	3.69%
Business-residence	*34	.....	100%					
Apportionment of Group III Business Expense				$ 65.14	$190.78	$ 14.54	$ 21.20	$ 11.17

L ENSE APPORTIONMENT.

Total St. Croix Rural Group III Expense = $522.68.

Classes of Service (repeated)	Total St. Croix Rural Message Telephone Units	*Add Back to Proper Classes	Total St. Croix Rural Message Telephone Units (revised)	Total St. Croix Rural Message Telephone Units Divided Among Classes of Service: Residence	Business	St. Croix Rural	Foreign Rural	Toll
Residence	254	4	258	129.0	.....	129.0	.....	.....
Business	161	9	170	.....	85.0	85.0	.....	.....
St. Croix rural	470	980	1,450	.....	.....	1,450.0	.....	.....
Foreign rural	261	.....	261	.....	.....	130.5	130.5	.....
Toll	26	.....	26	.....	.....	.....	.....	26
Operator	*60	.....						
Ring backs	*920	.....	2,165	129.0	85.0	1,794.5	130.5	26
Business-residence	*13	.....	100%	5.96%	3.93%	82.88%	6.03%	1.2%
Apportionment of Group III St. Croix Rural Expense				$ 31.15	$ 20.54	$433.20	$ 31.52	$ 6.27

ENSE APPORTIONMENT.

GROUP III.

NOTE: There is no New Richmond expense apportioned directly to foreign rural substations in the first apportionment.

	Total	Residence	Business	St. Croix Rural	Foreign Rural	Toll
Total Group III Apportionment	$1,844.20	$ 852.67	$346.30	$ 492.04	$110.28	$ 42.91

nn St. Croix Telephone Co. Expense.

We will attempt to apply these units to the traffic study and to ascertain in "message lines" and in "message telephones," the *use* which each class makes of the equipment of every other class. By comparing then the "message lines" or "message telephones" for any one class with the total for that class, we will arrive at the proportion at which each class should share in the expense of each other class.

Table No. 11 is a detail of the outlined operation. The table is divided into three sections, viz., Traffic Data, Apportionment of Group No. 2 expense (on "message *line*" basis) and Apportionment of Group No. 3 expense (on "message *telephone*" basis).

Explanation of Table 11.

It should be constantly borne in mind that in this "Second Apportionment" we are reapportioning expenses which have already been allocated to the various classes of service in the "First Apportionment," and that we have, therefore, our Group II and III expenses already divided up among "Residence," "Business," "Rural," etc., classes of service.

Let us consider first, the "residence" portion of the Group II expense which we find to be $1,481 from the summary of the "First Apportionment," Table No. 9. It is also the first item apportioned in Table No. 11. In the first section of this table under "Traffic Data," we find all calls originating and terminating with the "Residence" class of service and the total of these originating and terminating calls.

It will be apparent that a "Residence" to "Residence" call will use *two* "Residence" message *line* units, inasmuch as two residence lines will be used for each of this class of calls and that therefore the "Residence" to "Residence" calls will be multiplied by 2 in order that they be properly weighted (see Table No. 11, $611 \times 2 = 1,222$). On the other hand, in the case of a "Residence" to "Business," or a "St. Croix Rural" to "Residence" call, but *one* "Residence" message line unit per call will be used; hence the message line units for these calls will equal the total calls. (See Table No. 11, $711 \times 1 = 711$, etc.) Thus we have in column one of the Group II apportionment, the total residence message line units. In column two, the message line units of the last three classes of service are added back into the class of service which is responsible for them, as has been previously explained. Column three gives the total "Residence" message line units condensed to the five main classes of service.

The next step is to ascertain what part each class of service should share in the various groups of message line units appearing in this column. It will be apparent that all of the 1,398 "Residence" to "Residence" message line units should be charged to "Residence" and that all of the 73 "Residence" to "Toll" message line units should be charged to "Toll," for this apportionment is made on the assumption—whether correct or not—that the toll business must stand entirely by itself and that there should be no reciprocal sharing of expense between "Toll" and the other classes of service. However, between "Residence and "Business" and "St. Croix Rural" and "Foreign Rural," such a reciprocal sharing of expense is provided for. Hence if we divide this responsibility equally between the two classes between which the call is made, we will have the 770 "Residence" to "Business" residence message line units (see Table No. 11) divided, 385 to "Residence" and 385 to "Business"; the 254 "Residence" to "St. Croix Rural" residence message line units, one-half (127) to "Residence" and the other half (127) to "St. Croix Rural," etc.

Summing up the residence message line units for each class and obtaining the percentage which each sub-total is of the grand total, gives the basis upon which the $1,481 of Residence Group II expense is apportioned to the various classes of service. Following down the table, we find that the amount allocated to "Business" in the first apportionment of Group II expense is next apportioned on a basis exactly similar to the preceding apportionment as are also "St. Croix Rural" and "Foreign Rural," and at the bottom of the table appears a summary of all apportionments.

The third section of the table is the apportionment of the Group III or substation expenses as given in the Final Summary of the First Apportionment. The proceeding is the same as in the case of the Group II expense except that the "message-telephone" is used as the unit. The reason for the use of the "message telephone" instead of the "message line" in the apportionment of these expenses, will be apparent when we consider the "ring back" call.

This class of calls uses but one "message line" while it uses *two* "message telephones." The result is that the ring back call for each class of service in the Group III apportionment is weighted by the factor "2" instead of the factor "1" as used in the Group II apportionment. It may appear that this is an unnecessary refinement of the process. However, when we take into consideration that in some of the classes of service in this case the "ring back" calls form a large percentage of the total calls, we believe that it is justified.

Valuation.

Total cost of reproduction of foreign rural lines	$21,916
Total cost of reproduction less depreciation of foreign rural lines	12,273
Cost of reproduction of substation portion only	3,954
Cost of reproduction of wire plant portion only	17,962
Cost of reproduction less depreciation of substation portion	2,214
Cost of reproduction less depreciation of wire plant portion	10,059

Expense Account.

The average total operating and maintenance expense (excluding operators' salaries) for these lines is estimated at $4 per telephone.—340 telephones at $4 each	$1,360.00
41 per cent. of this is considered to be wire plant expense	557.60
59 per cent. substation expense	802.40
(These percentages correspond to the relation of substation to wire plant expense for the rural lines owned by the St. Croix Telephone Co.)	
Depreciation at 6.9 per cent. on above wire plant cost of reproduction	1,239.38
Depreciation at 9.3 per cent. on above substation cost of reproduction	367.72
Total wire plant expense (excluding interest)	1,796.98
Total substation expense (excluding interest)	1,170,12
Interest at 7 per cent. on $2,214 (substation)	154.98
Interest at 7 per cent. on $10,059 (wire plant)	704.13
Total interest charges	$ 859.11
Total wire plant expense (including interest)	$2,501.11
Total substation expense (including interest)	$1,325.10

Data Regarding Foreign Rural Lines.

It will be noted that up to this point we have not considered the expense directly incident to that portion of the foreign lines which is owned by the foreign companies; in other words, we have considered only expense directly appertaining to the equipment owned by the St. Croix Telephone Co. We therefor will now turn our attention to this other item. If we require the patrons of these foreign lines to share in all of the expenses of the St. Croix Telephone Co., it appears reasonable that the subscribers of the St. Croix Telephone Co. should also share upon a similar basis, and within reasonable limits, the expense incident to the foreign lines.

An approximate valuation has been made of the lines owned by the foreign rural companies, and the expense incident to the operation and maintenance of this property has been determined partly through evidence presented at the hearing and partly through estimates.

Although there were undoubtedly some factors of general and commercial expense entering into the total expense incident to these foreign lines, these amounts appear to be comparatively small. They have therefore been included in the two divisions into which it semed feasible to divide the total expense, viz.: Wire plant expense and substation expense, including interest and depreciation on each portion of the investment.

First Apportionment of Foreign Rural Expense.

Since there is but one class of patrons served by the foreign rural lines, no allocations of this expense to various classes of service are necessary and we may proceed directly with the second apportionment.

Second Apportionment.

The procedure in the case of the second apportionment of this expense is exactly similar to the method used in the second apportionment of the New Richmond expense items, the substation basis being used for the substation expense and the wire plant basis for the wire plant expense.

The details of this apportionment appear in Table No. 12.

Table No. 12 completes the second apportionments of all except the Group IV expenses, which are the general expenses of the St. Croix Telephone Co. These expenses, since there appears to be no logical basis upon which they may be attributed directly to any particular class of service, will be apportioned as overhead to the summary of the second apportionments thus far made.

Table No. 13 performs the operation of summarizing the second apportionments of expense, Groups I, II and III; apportions Group IV expense as an overhead to these apportionments; introduces the expense incident to that portion of the rural lines owned by the foreign companies; and arrives at the rate per telephone which (granting that the principles proposed herein are reasonable) should be charged and the total amount which the toll company should share in the expense of the St. Croix Telephone Co.

(To be concluded.)

Fort Wayne Company Reports Prosperous Year.

The financial report at the annual meeting of the Home Telephone & Telegraph Co., of Fort Wayne, Ind., held recently, showed that the past year had been the most prosperous in the company's history. There was a gain of 639 telephones in Fort Wayne during the year, making a total of approximately 11,000 telephones now in service. Seven thousand feet of underground cable extensions have been made and 35,000 feet of aerial cable extensions, while other extensions made during the year total 248,000 feet.

Announcement was made that the company contemplates the erection of a warehouse on some property purchased recently on North Clinton street. Switchboard capacity will be increased and the underground plant extended.

The following directors were elected for the ensuing year: Wm. L. Moellering, John B. Reuss, Isidor Lehman, Henry R. Freeman, Max B. Fisher, W. A. Bohn, August E. C. Becker, G. Max Hoffman and Frank E. Bohn.

The directors then met and elected officers as follows: President and general manager, Wm. L. Moellering; vice-president, John B. Reuss; secretary and assistant general manager, Frank E. Bohn; treasurer, Max B. Fisher.

Foreign Rural **Wire Plant** Expense=$2,501.11.

Traffic Between Foreign Rural and	Traffic Data. Originating	Terminating	Total Calls	Total Foreign Rural Message Line Units	*Add Back to Proper Classes	Total Foreign Rural Message Line Units (revised)	Total Foreign Message Line Units Divided Among Classes of Service: Residence	Business	St. Croix Rural	Foreign Rural	Toll
Residence	160	167	327	327	12	339	169.5	.....	.....	169.5	.....
Business	116	119	235	235	25	260	.....	130	.....	130.0	.....
St. Croix rural	118	143	261	261	.....	261	.....	.....	130.5	130.5	.....
Foreign rural	461	461	461	922	1,078	2,000	.....	.....	.....	2,000.0	.....
Toll	34	9	43	43	.....	43	.....	.....	.....	.....	43.0
Operator	43	5	48	*48)							
Ring backs	1,030	1,030	1,030	*1,030)	.....	2,903	169.5	130	130.5	2,430.0	43.0
Business-residence	27	10	37	*37)	.....	100%	5.84%	4.48%	4.50%	83.70%	1.48%
Apportionment of above Wire Plant Expense						$2,501.11	$146.06	$112.05	$112.55	$2,093.43	$37.02

Foreign Rural **Substation** Expense=$1,325.10.

Traffic Between Foreign Rural and	Originating	Terminating	Total Calls	Total Foreign Rural Message Telephone Units	*Add Back to Proper Classes	Total Foreign Rural Message Telephone Units (revised)	Total Foreign Message Telephone Units Divided Among Classes of Service: Residence	Business	St. Croix Rural	Foreign Rural	Toll
Residence	160	167	327	327	2,108	3,030	.....	.....	.....	3,030.0	.....
Business	116	119	235	235	12	339	169.5	.....	.....	169.5	.....
St. Croix rural	118	143	261	261	25	260	.....	130	.....	130.0	.....
Foreign rural	461	461	461	922	.....	261	.....	.....	130.5	130.5	.....
Toll	34	9	43	43)	.....	43	.....	.....	.....	.....	43.0
Operator	43	5	48	*48)							
Ring backs	1,030	1,030	1,030	*2,060)	.....	3,933	169.5	130	130.5	3,460.0	43.0
Business-residence	27	10	37	*37	.....	100%	4.31%	3.31%	3.32%	87.97%	1.09%
Apportionment of above Substation Expense						$1,352.10	$ 57.11	$ 43.86	$ 43.99	$1,165.70	$14.44
Summary of above Wire Plant and Substation Apportionment: Total						$3,826.21	*$203.17	*$155.91	*$156.54	$3,259.13	*$51.46

*Total amount of the above starred items amounts to $567.08 and is the amount of Foreign Rural Expense charged to New Richmond (See Table No. 13).

Table No. 12. Second Apportionment of Expense Directly Incident to Foreign Rural Lines.

	Total	Residence	Business	St. Croix Rural	Foreign Rural	Toll
Group I—						
Central office operators' salaries	$ 2,264.89	$ 454.89	$ 283.55	$ 280.51	$ 463.98	$ 781.96
Commercial expense	429.12	146.02	46.25	26.55	4.42	207.88
Total Group I	$ 2,694.01	$ 600.91	$ 327.80	$ 307.06	$ 468.40	$ 989.84
Group II total	$ 3,705.03	$1,289.30	$ 487.84	$1,299.59	$ 389.96	$ 238.34
Group III total	1,844.20	852.67	346.30	492.04	110.28	42.91
Totals	$ 8,243.24	$2,742.88	$1,161.94	$2,098.69	$ 968.64	$1,271.09
Percentages of total	100%	33.27%	14.10%	23.46%	11.75%	15.42%
Group IV (apportioned as overhead)	$ 1,345.14	447.54	189.66	342.47	158.05	207.42
Final apportionment of total expenses of St. Croix Telephone Co.	$ 9,588.38	$3,190.42	$1,351.60	$2,441.16	$1,126.69	$1,478.51
Part of St. Croix Telephone Co. expense to be shared by foreign lines	.....	.....	.....	.....	$1,126.69	.....
Part of foreign lines expense to be shared by St. Croix Telephone Co. (See Table No. 12)	567.08	203.17	155.91	156.54	.....	51.46
Totals on which to base rates for St. Croix Telephone Co.	$10,155.46	$3,393.59	$1,507.51	$2,597.70	.....	$1,529.97
Amount upon which to base rates for switching service for foreign rural lines ($1,126.69—$567.08)					$ 559.61	

Table 13. Summary of Second Apportionments, St. Croix Telephone Co.

Fundamental Principles of the Telephone Business

A Reading Course Designed to Present Logically the Principles Which Underlie Successful Organization and Operation of Telephone Properties—Prepared Under the General Supervision of Stanley R. Edwards—Part I, Telephone Economics, by James H. Shoemaker, Completed June 26, 1915—Part II, The Corporate Telephone Organization, by J. C. Kelsey and S. R. Edwards, Completed September 25 Part III, Telephone Accounting and Auditing, Written by James H. Shoemaker

Quiz Questions on the Preceding Installment.

92. Mention some of the questions upon which many managers and bookkeepers desire information.

93. What was the problem which confronted the manager of one telephone company?

94. What changes had taken place in the plant and the capitalization of the company?

95. What experience in common have many telephone companies?

96. State some questions which throw light on the matter of showing depreciation on the books and balance sheet. What distinction is made between ordinary and extraordinary repairs?

97. Why must repairs be divided into two classes? Define extraordinary repairs.

98. In what general way is the depreciation reserve handled so far as charging gross earnings and crediting reserve for depreciation are concerned?

99. How was money spent in changing from local battery to common battery entered on the books? What recommendation was made relative to the amount held in the suspense account?

CHAPTER IX. Reserves and Surplus (Continued).

100. *Reserves and Cash.*—The bookkeeper did not like the idea of having anything whatever in the surplus account, or the reserve account, at the close of the year because the shareholders and directors always asked that seemingly unanswerable question: "What's the use of a reserve, or a surplus, if you do not have it in cash?"

The explanation of that point was made by means of a series of questions, the answers to which brought out the principles involved.

101. *Source of Money Put into Plant to Increase Its Value.*—"Where did you get that extra $8,000 which you added to the actual total value of the plant when you put in your common battery switchboard and telephones?"

"We borrowed $3,000 at the bank and got $5,000 out of the earnings for the year."

"Why do you not go and borrow $5,000 more at the bank to cover the total of your honest increase of investment? That would increase your cash on hand, would it not?"

"Yes, but that would be foolish, for we would have to pay the bank 5 per cent. interest."

"Why do you not sell $8,000 worth of common stock, take up the note at the bank, and still have the $5,000 in cash?"

"Because we know that we can pay off that $3,000 out of next year's earnings. The shareholders do not want to go above $100,000 in the amount of their capital stock and that amount has already been issued."

"Well, can you not see that you have this $8,000 extra value in your plant? Can you not see that you have the unquestionable right to sell $8,000 worth of stock, pay off the $3,000 loan and put $5,000 into surplus? Can you not see that if you were to have a $5,000-fire in your 'central' or a $5,000 sleet storm, you are entitled to borrow that $5,000 on your surplus plant or on your reserve account, if you'll only set up a reserve?

Can you not see that you are entitled to sell $5,000 worth or $8,000 worth of stock because of that $8,000 which you have actually put into plant extension?"

102. *Account Which Had Been Charged Instead of Crediting Reserve Account.*—"It seems plain enough in theory," said the manager, "but where in the world am I to get that $8,000 which you say I must credit to the account called 'Reserve for Accrued Depreciation?'"

"Is not that $8,000 in your reserve already?"

"No," answered the manager.

"Well, where is it? What did you charge or debit when you credited 'Pay Roll,' and when you credited 'Material and Supplies' for this reconstruction and new construction work?"

"For the $8,000 which we treated as 'Extension of Plant,' we charged 'Unfinished Construction' with $8,000 in a lump sum. I'd entirely forgotten that account. I see now that we should debit this unfinished construction account and credit 'Reserve for Depreciation.'"

103. *Other Errors in Not Crediting Depreciation Reserve.*—"Suppose, though, that we had not opened this account called 'Unfinished Construction,' where would we have gotten this $8,000 for depreciation reserve?"

"You would have to take it from whatever account you had credited with the extraordinary repairs and with the construction items when you debited your materials and supplies and your pay roll accounts. To make those debits, you had to credit some other account. If all this had been credited to operation—that is, to ordinary repairs—you would show an $8,000 loss, outgo or expense. That would be wrong, for the reason that it was, in reality, an $8,000 addition to your capital invested.

It would be your duty, therefore, to make an entry debiting or reducing the cost of ordinary repairs and crediting reserve for depreciation. On the other hand, if, when you debited or decreased your cash and stores account for this $8,000, the corresponding credit had been shown as loss, then you should debit or decrease your loss account and credit or increase your plant account. That $8,000 item would appear as it should.

Unless this is done, your plant is plainly worth $8,000 more than is shown on the books."

104. *Division of Amount Credited to Reserve and to Surplus.*—"I want to be as near right as possible," said this manager. "How am I to tell how much of this $8,000 should be credited from unfinished construction to reserve and how much to surplus?"

"You should credit all of it to plant in the first place. But now you've struck a question which hits the bull's-eye of this accounting target—you have rung the bell with that question. You must decide, first of all, the cost or value of your plant. Then you must decide the average years of depreciation.

There are two ways of getting these figures. One is by invoicing everything down to the last shingle nail, pricing it out and figuring depreciation from the date it was put into the plant. The other is to get at it by averages."

105. *Approximating the Plant Value.*—It was agreed that nothing short of a detailed inventory would satisfy the commission. That plan was, therefore, begun. Before beginning the task, two men spent one day in an effort to anticipate the total of the inventory. This is the method they followed:

The plant consists of 1,800 telephones. They did enough figuring to reach the conclusion that in actual experience it had cost this company $77 per telephone to first construct, according to the standards of 1899, then rebuild twice, and finally get the equipment up to an all cable, common battery plant in 1915.

That meant a plant cost of $138,600. So much of the plant had been renewed in 1914 and 1915, that an average of three years of depreciation, or 18 per cent., was deemed about right. It was decided, therefore, that there should be a total reserve for accrued depreciation amounting to $24,840.

There was $8,000 available from the forgotten credit in the "Unfinished Construction" account. It was necessary, therefore, to add $16,840 to that $8,000. This had to be taken out of the plant account which, as previously stated, appeared on the old books as $150,000. But, as it had been decided that $77 per telephone was the estimated cost, it was necessary to make adjustment entries cutting down the cost of plant to $138,600—a reduction of $11,400, or, $6.33 per telephone.

	Assets.	Liabilities.
Plant January 1, 1915	$130,600.00	
Additions to plant since Jan. 1, 1915	8,000.00	
Cash and deposits	2,341.16	
Due from subscribers	3,421.20	
Materials and supplies	2,140.15	
Prepaid directory expense	18.40	
Capital stock		$100,000.00
Notes payable		11,000.00
Service billed in advance		2,700.30
Accrued taxes		650.00
Accrued insurance		10.50
Reserves:		
For accrued depreciation		24,840.00
For dividends		6,000.00
Net surplus		1,320.11
	$146,520.91	$146,520.91

Note: This balance sheet has been arbitrarily increased, proportionally, to a total capitalization of $100,000. All the actual figures were less in proportion to those given.

Fig. 8. Balance Sheet of Blackville Telephone Co.

106. *The Balance Sheet.*—The accompanying balance sheet, Fig. 8, will show how the difference between a capital of $100,000 (in stock) and a plant value of $138,600 is accounted for. Before turning to the balance sheet, let it be observed that this is plant cost and that it includes $24,840 allowed for depreciation of the older portions. It should be observed that to provide for depreciation, a new item appears on the liability side of the balance sheet now, for the first time.

After completing the balance sheet, both the bookkeeper and manager were still worried about the mere showing of reserves amounting to $32,160 with not one-tenth of that amount in cash. Besides this, the manager was worried with the fear that his value of $77 per telephone was too high.

107. *The Cost Per Telephone.*—He was told that with regard to his cost per telephone, he would have to make the best of it. If the expense of learning the business is allowed by commissions in the final capitalization, this company is perfectly safe. It costs more to change from a grounded system to common return than it would cost to reproduce the common return plant. (Of course the excess in this case is almost negligible.) It costs more to change from common return to full metallic, and keep everybody in service, than to construct a new full metallic plant. It costs more to change from open wire to all cable, while giving continuous service, than to build a similar cable plant new.

If these legitimate extra and actual costs are allowed, the Blackville company's plant will remain at a capitalized value of $77 per telephone. If these costs of learning and keeping up with the business are "knocked out," the shareholders of the Blackville Telephone Co. can credit themselves up with having conducted a public service experiment at private cost. There is no such thing as contradicting the fact that an engineer within full possession of all that has been learned since January 1, 1899, could build a new plant for less than any man in the world could have kept up continuous service and continuous advancement of construction, equipment, etc., from 1899 to 1915.

108. *The Cost of Learning the Business.*—This manager was shown that much of the issue rests upon this question:

Should his company be made to pay the penalty for having charged $3 a year less than it should have charged from 1899 to 1907?

There was a period of between five and six years during which the company paid an average of $1 too much per telephone (each year) in dividends; and charged $3 less per year than it should have received for service.

If a shareholder of that period died or sold out, he received $5 per telephone more than his share. If a user of the service of that period has since died or moved away, he obtained $3 a year, or $15 per telephone, more than his share.

The users of the service in the future may be held by commissions and courts as free from responsibility for the cost of learning the business. If that be the case, then the shareholders of the Blackville Telephone Co. will have to stand their punishment for having "stayed in." They will have to stand their punishment for having "pulled the enterprise through the measles, whooping cough, and scarlet fever." They will have to stand the pain of having a part or all of that $20 per telephone knocked out.

While this may not be a part of bookkeeping, it seems to the author to be important that bookkeepers be able to make these matters clear to the manager who must defend the

money of his shareholders before councils, courts and commissions.

109. *One Policy Regarding Reserves not in Cash.*—As to the shareholders' suspicion of reserves which are not in cash, the author adopted this policy:

If we doubt that any share is worth $100, we should sell it. If our shares are not worth par, then there is an item of $100,000 on the liability side of our balance sheet needing our first attention. But if the plant cost, the money in the bank, and the other things on the asset side are reliable enough to satisfy us that our shares are worth a hundred cents on the dollar, then that entire reserve is worth a hundred cents on the dollar.

We have $38,600 more in plant than in stock. Allow me to sell that additional $38,600 worth of stock and I'll put $38,600 in the bank in cash. But so long as you refuse to sell shares you can not have that $38,600 in cables, telephones and switchboards and have it in the bank, also. This raises the questions:

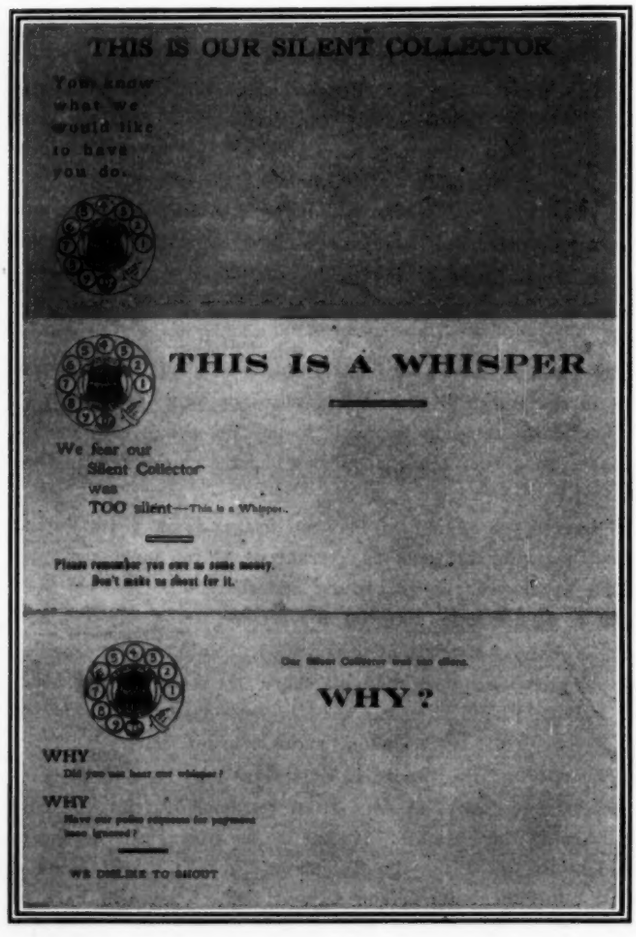
How much should be held as quick assets and, in what what form should quick assets be kept? The discussion of that belongs, however, to the financial rather than the accounting side of the business and will therefore be considered in the part of "Fundamental Principles of the Telephone Business" to be devoted to "Telephone Finance.'

(*To be Continued*)

Practical Subjects—Letters and Discussions

A Novel Means of Speeding Up Collections.

A decided departure in the matter of collection of subscribers' accounts has been made by H. J. Parsons, cashier of the Federal Telephone & Telegraph Co., Buffalo, N. Y. Instead of having form letters to send to subscribers, requesting payment, he has prepared a series of requests, printed on the face of blotters, which are mailed at intervals without any other enclosure. These so-called "silent collectors" are reproduced in the accompanying illustration. The original of the first reminder is printed on gray blotter paper, the second on blue, and the third on yellow paper.


THIS IS OUR SILENT COLLECTOR
You know what we would like to have you do.
THIS IS A WHISPER
We fear our Silent Collector was TOO silent—This is a Whisper.
WHY?
WHY
WHY
WE DISLIKE TO SHOUT

Silent Collector of the Federal Telephone & Telegraph Co.

Mr. Parsons states that the use of these blotters has been very successful in speeding up collections.

Co-operative Club of Cynthiana (Ky.) Operators.

When the Co-operative Club of the Cynthiana (Ky.) Telephone Co. held its regular monthly meeting recently, the manager of the company observed that it was the 20th of these meetings held by the club. The same observation recalls the fact that the Cynthiana exchange was the first in the Central Home Telephone & Telegraph Co.'s system to organize and that from the outset it has set the pace for the other clubs in the system.

It is interesting to trace the development of the operators' associations in the Central Home system in which operators of all except the very small exchanges are now organized. Most of them have their special names, and all of them have their officers, keep regular minutes and hold meetings at regular intervals for discussing their work. Some of them operate with a system of dues, providing that on each meeting night all of those present pay five cents into the treasury, while those who are absent, except in case they are on duty, are fined 10 cents. When these funds accumulate, the company and the manager of each of the exchanges add to the total and the club has a little celebration.

When B. Y. Chambers, now assistant superintendent of the Central Home, was manager of the Frankfort Home company, he held fortnightly what became "get-together" meetings of the whole force of employes. After he came to the main office this practice fell into disuse until, in his report of the benefits gained, S. M. Heller, general manager of the company, approved a plan for organization of operators throughout the system. The Cynthiana branch was the first to act on the suggestion, organizing a little over a year and a half ago, the Co-operative Club.

Good effects of the activities and studies of the club began to be evident from the outset. There was a spirit of co-operation in evidence at all times. A better spirit in performance of their duties began to be displayed by the operators and all who had to do with that end of the business. Efficiency began to result and one of the conspicuous benefits was the "training up" of Miss Clyline Lusby, who started in as an operator at the Cynthiana exchange, but who is now a service scout for the company, making trips from exchange to exchange throughout the system building up the service where there is need of expert aid.

Three times this past year the Cynthiana exchange has changed chief operators. Managers of telephone exchanges in the smaller towns know what it usually means to let one chief operator go and to put another in her place. The change, each time, was accomplished at the Cynthiana office without the slightest hitch in conduct of the business of the exchange or without loss or let-down in efficiency, each time the new chief operator coming from the employes in the Cynthiana office. The removals, it may be noted, were due to weddings in which the retiring chief operators took the principal parts. There has been no confusion at the Cynthiana office and no necessity of special services of expert operators to straighten out tangles since the club organized and went to work.

That the Cynthiana operators are continuing their enthusiastic work, is indicated by the report of the last monthly meeting of the club. All operators were present at this meeting except two, who were busy. In this connection it may be said that membership in all of these exchange organizations is voluntary, encouraged though by no means required by the company, although it soon becomes evident by the amount of interest they take in the work of the organizations who are the live and ambitious members of the various staffs.

Returning to the meeting, Miss Lela Florence, local operator, read a paper on "My Experience as an Operator;" Miss Mary Ashcraft, assistant chief operator, on "Proper Handling of Toll Work;" while Miss Mary Layton, chief operator, made a short talk on "General Operating." In addition to these talks and papers the manager of the company, C. M. Mynheir, made a short talk from the manager's viewpoint.

The members of the Co-operative Club, including Manager Mynheir are: Miss Mary Layton, chief operator; Miss Mary Ashcraft, assistant chief operator; Mrs. Edith Heck, night operator; Misses Zula Taylor, Catherine Cox, Etta Blackburn, Lela Florence and Maggie Galeener, local operators; Mrs. Aline Williams, cashier, and Miss Lilly Smith, collector.

INDEX FOR TELEPHONY, VOLUME 69.
The index for Volume 69 of TELEPHONY, which was completed with the issue of December 25, 1915, is now ready for distribution among those who keep complete files of TELEPHONY. In this index are listed the most important articles which have appeared in TELEPHONY between July 3 and December 25, 1915. It will be supplied free to those making application.

Construction Work Under Way at Duluth, Minn.

A private branch exchange switchboard has been installed by the Northwestern Telephone Exchange Co. in the administration building of the Minnesota Steel Co.'s plant at Morgan Park, Duluth, Minn. Eighty telephones were installed in and around the plant and a 24-hour service is to be maintained.

Telephone stations are located in every department of the plant to connect direct with the private switchboard. All connections in the installation of this system were cared for principally by underground cables. One hundred and thirty-five miles of wire were used.

A similar equipment, but on a smaller scale, is to be installed in the Universal Portland Cement Co.'s plant.

Both of these exchanges will be operated in connection with the Douglas exchange at Gary. This exchange was opened in the summer of 1913, and takes care of New Duluth, Gary, Fond du Lac, Morgan Park and Smithville.

The company has just completed the construction of a cable from New Duluth to Fond du Lac, and will shortly change all subscribers in that locality from four-party to two-party lines with no increase in the present rates.

To take care of that portion of the city west of Seventy-first avenue, west, the company has installed four miles of underground conduits, 15 miles of aerial cable and 4,000 miles of wire.

A Convincing Telephone Advertisement.

Some pertinent facts as to why people living in Oil City, Franklin, Titusville, Pleasantville and Clintonville, Pa., should become subscribers of the Petroleum Telephone Co., of which W. S. Paca is general manager, are given in an advertisement which recently appeared in the newspapers in the territory in which the Petroleum company operates. The two-column newspaper advertisement used is shown in the accompanying illustration. It is put up in type easy to read, and no doubt produced results.

THE IDEAL IN TELEPHONE
operation is conceded to have been attained when a telephone company is locally controlled, has a large number of local stockholders, is giving a standard grade of service at low rates, and has UNIVERSAL LONG DISTANCE CONNECTIONS COVERING ALL POINTS IN THE UNITED STATES AND CANADA.
The Petroleum Telephone Company
believes it to be its duty to announce that it is now operating under all of the above ideal conditions, and to tender its thanks to the general public for its liberal patronage.
THE TOTAL LIST OF STATIONS DIRECTLY connected with Petroleum Company's various exchanges includes OVER SEVENTY-FIVE PER CENT OF ALL THE TELEPHONES IN THE AREA SERVED.
Oil City 3,258
Franklin 1,677
Titusville 1,605
Pleasantville 158
Clintonville 237
Total 6,935
In addition there are over 1,100 Rural Line Stations served exclusively by the Petroleum.
ARE YOU IN THIS LIST?
THE NEXT ISSUE OF THE DIRECTORY GOES TO PRESS DEC. 15.
If you do not have a Petroleum Telephone, you are either imposing on yourself or possibly, on somebody else.
CALL THE CONRACT DEPT. TODAY
Get in the New Book
A Petroleum Phone Prompts Prosperity.

Newspaper Advertisement of Petroleum Telephone Co.

Proceedings Before Commissions, Courts and Councils

Discussions and Rulings of State Bodies Having Supervision Over Telephone Companies, Decisions of Courts in Matters of Interest to Public Utilities and Actions of City Councils Relative to Franchises, Rates and Service

Company Must Extend Lines Where Demanded.

In an opinion handed down December 18, the Colorado Public Utilities Commission ruled that the Mountain States Telephone & Telegraph Co. must extend its lines to small towns in Colorado, where extension is demanded, even though the new investment may not immediately pay a fair return to the company, provided that these unprofitable extensions do not reduce the general earnings of the corporation below a certain point.

The commission held that the telephone company is a monopoly, and that, because of this fact, it must give service. The public cannot get the service denied by the telephone company from any other source. Relief is impossible except through the telephone corporation. For this reason, the commission held, the company cannot refuse relief to the public unless its total revenues are cut below a fair point.

The telephone company has contended heretofore that each branch line must be considered as a unit, and that it could not be forced to build new units unless the business in sight were sufficient to pay interest on the investment. It asserted that many of the small communities that were demanding lines into their towns did not have enough people to make the asked-for extension pay.

In its findings, the utilities commission refused to allow each branch to be considered as a unit. The total earnings of the corporation alone are to be considered. For instance, the commission holds that if the company's earnings are above a sum that the commissioners consider a legitimate return, the building of new, even if unprofitable, lines cannot be denied. The commission, however, will not force the company to build enough extensions to cut its return below a legitimate line.

The telephone company was ordered to extend its lines to the towns of Burlington, Bovina, Arriba, Flagler, Seibert, Vena and Stratton, all in eastern Colorado. Inhabitants of those towns had testified before the commission that they were cut off from the trade centers of Colorado because they could not get telephone service into Denver, Pueblo, Colorado Springs, or other large points.

To Settle Grievances Resulting From Michigan Merger.

A conference was held at Hillsdale, Mich., on December 17, by representatives of Independent telephone companies, the Michigan State Telephone Co., and C. B. Hall, representing the Michigan Railroad Commission, to settle grievances and disputes arising from the merger of certain properties of the Southern Michigan Telephone Co. in Hillsdale county with the Bell company.

In speaking of the conference, Mr. Hall said that he regarded it as the most radical step which has been taken toward the adjustment of telephone difficulties at any time in the state.

"This conference," he said, "was simply an endeavor, in an informal way, to adjust the telephone conditions so that they will be worked out in accordance with orders already issued by the commission. If we can bring about an amicable adjustment so as to serve the public, it is within our province to do so. If we cannot, it leaves it to the different interests to formally present the matter to the commission."

All the points of difference or grievance were set forth during the morning and afternoon, so that the particular points were left to a committee, to meet in the evening, the different telephone interests having agreed that as to the routings, those that are not so far covered will be taken care of by the routing instructions as formulated by the Michigan Independent Telephone & Traffic Association and the Michigan State Telephone Co. Both have agreed, or acquiesced, to the routings to be issued by January 1, if possible, by this association as recommended by this committee.

One of the particular points of the contention was a system now in vogue by the Bell interests known as center-checking and effective as of January 1 on a three months' trial. That feature objectionable to the Independent telephone companies will be eliminated, so far as it concerns Independent business. An adjustment agreeable to all interests has been reached, and the general telephone service to the public will be greatly improved.

The two main points at issue were center-checking and routing, and these have been adjusted."

Plans will be carried out now whereby the grouping of circuits leading from Hillsdale to Owosso, Pittsford, Ransom, Frontier, Camden, Montgomery and Reading will be made, and similar plans perfected for other points in the county. By thus grouping circuits, they are made very much more available and there will be fewer delays in putting through a call.

The Bell interests and the Independent companies, it is said, will jointly establish operators' schools in the county and will in other ways co-operate in perfecting the operating service.

Perry (Ill.) Company Granted Certificate of Convenience.

The petition of the Perry Telephone Co., of Perry, Pike county, Ill., for a certificate of convenience and necessity, was granted by the Illinois Public Utilities Commission on December 23, after two rather lengthy hearings.

This is the company which a short time ago was restrained from establishing an exchange in Perry until it had secured a certificate from the commission. It at first contended that as it proposed taking over the business of ten rural lines which were established before the commission act took effect, a certificate was not required, but it later made application.

The Pike County Telephone Co. and the Illinois Independent Telephone Association objected to the granting of the certificates. It was claimed that the Pike county exchange in Perry cared for the business there. The Perry company, however, presented a petition signed by residents and contended that the ten rural lines did not consider the exchange already established sufficient.

The commission took the view that these lines are entitled to exchange service, and therefore granted the certificate, with the proviso that it must make physical connection with the Pike county company and must not serve any of the territory now served by that company.

Compensation Denied to Employe Injured in Scuffle.

The Wisconsin Industrial Commission, on December 29, denied compensation to an employe of the Wisconsin Telephone Co. who was injured in a scuffle with other employes, during the time he was employed.

While engaged in setting poles, Arthur Smith, 24 years of age, of Menomonee Falls, was injured in a scuffle. He

was totally disabled for three months and sought compensation. Smith was one of a crew of men and boys engaged in setting telephone poles. Just shortly after he had finished his part of the work in rimming out a post hole and stood aside watching its completion by another employe, one of the boys knelt behind him and another pushed him quickly over, so that Smith fell prostrate to the ground. As soon as he got to his feet he grabbed one of the other employes. They wrestled a bare moment when both fell, Smith striking his knee on a pike pole, causing the injury for which this proceeding was the result.

"The question is whether applicant may be said to have sustained his accident while performing service growing out of and incidental to his employment," says the commission's decision. "Our conclusion is that he cannot—that he was outside the course of his employment at the time.

"We do not take the respondent's view that an employe injured by the playfulness of his co-employes, may not under any condition recover compensation. We have held in effect, and as we believe correctly, that where such playfulness may be fairly said to be a hazard of the industry and the party injured by it was not voluntarily engaging in the sport but pursuing the duties of his employment, his injury is the result of accident and he is entitled to recover compensation. We believe, however, that right of recovery cannot extend so far as to include those who have stepped aside from their regular line of duty and at the time are voluntarily engaging in and being a part of the sport that causes the disability."

Complaint Against Beloit (Wis.) Company, Dismissed.

The Wisconsin Railroad Commission, on December 28, dismissed the complaint against the Beloit (Wis.) Farmers' Telephone Co., alleging violation of the law prohibiting non-duplication of lines. This company had extended its lines from Shopiere to Tiffany Station, a territory served by the Rock County Telephone Co., without notice to the latter company as required by law. The commission, after a hearing, found that the Beloit Farmers' Telephone Co. believed that this law related only to paralleling lines. The commission said that while this was a technical violation of law, had the application been made in the regular way it would have granted the application for the extension in the first instance, and thus dismissed the complaint.

Hearing of Protest of Valuation of Lima (Ohio) Company.

Hearing of the protest of the Lima Telephone & Telegraph Co. against the tentative valuation recently placed upon its plant by the Ohio Public Utilities Commission will be held at Columbus, January 27.

The appraisement by the state was ordered by the commission in April, when the Lima city council charged that the telephone rates were too high and made a protest to the commission. It was urged by the city that the company's valuation of the plant, as a basis for the rates, was excessive.

The company now charges that the experts of the commission, in valuing the property at 8 or 10 per cent. lower than did the company, have undervalued certain factors that enter into the appraisement.

Rate for Interchange Messages of Lebanon (Wis.)

On the application of the Lebanon Telephone Co. of Lebanon and Clyman, Wis., for a change of rates, the Wisconsin Railroad Commission permitted the company to substitute for the present method of payment to the Wisconsin Telephone Co. for service through the Watertown exchange a payment of three cents per call for each message from the Lebanon exchange through the Watertown exchange and vice versa. It dismissed that part of the complaint of the Lebanon Telephone Co. asking for an increase of the rural rates from $1.25 to $1.50 a month. The three-cent exchange rate became effective January 1.

Burton (Neb.) Telephone Co. to Increase Rates.

The Nebraska State Railway Commission has authorized the Burton Telephone Co., of Burton, Neb., to increase its rates as follows: Business telephones, from $1.25 to $2; residence telephones, from $1 to $1.25; switching farm line telephones, from 25 to 50 cents per month.

The Burton Telephone Co. is one of the smallest companies in the state. It has four business telephones and eight residence telephones in town, and 48 farm line patrons. The total revenue from all sources for the past year, as reported by the manager, was $289.60. He paid out $263.30, leaving a balance of $26.30 to show as profit for the year's operation, not allowing anything for depreciation.

Cleveland Bell Protests Commission's Valuation.

The Cleveland Telephone Co. has filed a protest against the tentative valuation placed on its property by the Ohio Public Utilities Commission. Omission of large items and failure to allow $1,000,000 for intangible values, such as financing and interest during construction, are claimed. The reproduction value fixed by the commission was $7,391,166. If the company's claim were allowed, the value of the physical plant would be in the neighborhood of $10,000,000.

Proposed Merger at Paola, Kan.

A movement is on foot for the merger of the Miami County Telephone Co., of Paola, Kan., and the Paola Telephone Exchange. The proposition, as set forth by the Paloa Telephone Exchange, provides for a merger on a basis of $60,000 capital stock, the new company to pay the outstanding debts of the Miami County company and each shareholder in the latter company to be given $30 in stock in the new company for each share of Miami stock. It also provides for a number of improvements in the system.

Southern Bell Purchases Telephone Properties in Florida.

The Southern Bell Telephone & Telegraph Co. has purchased all the properties of the Florida Telephone Co. in West Florida. The deal includes four exchanges and about 300 miles of long distance lines. The exchanges are located in Chipley and surrounding towns. It is understood that the purchase price was $54,000. The Southern Bell company expects to spend about $50,000 in the next six months improving the service and extending the lines.

Valuation of Joplin (Mo.) Telephone Plant.

A survey and physical valuation of the plant and property of the Home Telephone Co., of Joplin, was filed with the Missouri Public Service Commission, December 16, by George P. Player, telephone engineer, and S. R. Morrow, civil engineer, of the commission. The property devoted to service of the city of Joplin is placed at $575,755 in the valuation.

Toll Extensions in Southern Kentucky.

The Gainesboro Telephone Co. has recently completed stringing a new copper circuit from Albany, via Burkesville, and Monticello, to Burnside, Ky. This new copper circuit is handling toll business to and from these points and opens up a territory that has heretofore not had toll service.

Summary of State Commission Hearings and Rulings.

CALIFORNIA.

December: The commission granted the Roseville (Cal.) Telephone Co. an extension of time to December 31, 1915, within which time to issue stock previously authorized by the commission.

December: The commission authorized the Corona Union Telephone & Telegraph Co., of Corona, Cal., to issue 16 shares of stock in lieu of stock heretofore issued without the commission's authority.

COLORADO.

December 18: The commission ordered the Mountain States Telephone & Telegraph Co. to extend its lines to the small towns of Colorado, where extension is demanded, even though the new investment may not immediately pay a fair return to the company, provided that these unprofitable extensions do not reduce the general earnings of the corporation below a certain point. This order was issued as a result of complaints filed by citizens of Flagler asking for an order requiring the company to extend its service to a number of towns in Eastern Colorado.

ILLINOIS.

December 23: Certificate of convenience and necessity granted to the Perry Telephone Co., of Perry, Ill., with the proviso that it must make physical connection with the Pike County Telephone Co. which operates an exchange in Perry, and must not serve any of the territory now served by that company. The Perry company is to take over ten rural lines in the vicinity of Perry.

December 23: Agreement between Ada Hanks and Ray G. Smith and the Commercial Telephone & Telegraph Co. for the sale to the Commercial company of the telephone exchange located at Wayne City for $431, approved.

December 23: Permission given the Schuyler Telephone Co. to issue its capital stock in the sum of $8,500 and to purchase two telephone lines from Rushville to Camden belonging to Moses Weinberg.

KANSAS.

December 9: Hearing on the case of the Reading Mutal Telephone Co. vs. the Emporia Telephone Co. and W. W. Finney, its president, which was set for this date, was indefinitely postponed. Case No. 945.

December 9: Hearing on the case of the Emporia Telephone Co. vs. the Reading Telephone Co., scheduled for hearing on this date, was indefinitely postponed. Case No. 985.

December 9: Hearing on the application of the Emporia Telephone Co. for an increase in rates on desk sets, set for hearing on this date, was postponed. Case No. 1115.

December 28: Hearing on application of F. M. Campbell for permission to sell first mortgage on Humboldt telephone property. Case No. 1169.

MASSACHUSETTS.

December 30: Hearing on the subject of service and rates for extension telephones in the state, at which all persons having complaints to make on this phase of the telephone service has been requested to be present.

MICHIGAN.

December 17: Conference between representatives of the Independent companies in Hillsdale county, the Michigan State Telephone Co. and C. B. Hall representing the commission for the purpose of adjusting differences growing out of the merger of certain properties of the Southern Michigan Telephone Co. with the Bell company. The two main points at issue were the Bell company's system of center-checking and routing of toll messages. Plans have been made whereby the objectionable features of this system will be eliminated and difficulties settled.

January 12: Continued hearing on application of the Michigan State Telephone Co. for permission to increase its rates at Detroit.

MISSOURI.

December: Application filed for permission to transfer the property of the Hunnewell Telephone Exchange at Hunnewell, from C. E. Tracy to W. F. Hawker, for a consideration of $4,500.

December 16: Survey and physical valuation of the plant and property of the Home Telephone Co. of Joplin, Mo., filed with the commission. The valuation of the company's property devoted to service of the city of Joplin is placed at $575,755.

January 22: Continued hearing in the matter of the application of the Kansas City Southern Railway Co., asking that the commission adopt uniform rules and regulations governing the construction of telephone, telegraph and other electrical signaling wires over the tracks and rights of way of railroad companies in the state. A committee has been appointed, composed of members of the different wire using companies, with Commissioner Howard B. Shaw, as chairman, to secure data and draft a set of proposed specifications for the instructions.

NEBRASKA.

December: The commission authorized the Burton Telephone Co., of Burton, Neb., to increase its rates as follows: Business telephones, from $1.25 to $2; residence, from $1 to $1.25; switching farm line telephones, from 25 cents to 50 cents per month.

December 30: Hearing on application of the Lincoln Telephone & Telegraph Co. for permission to change its rates at Glenville. The petition asks for reduction of 50 cents a month for residence telephones and no change in one-party business telephones, but an increase from $2.75 to $3 for two-party residence telephones and the four-party residence rate to be cancelled.

January 4: Hearing on application of the Gothenburg (Neb.) Telephone Exchange for permission to increase its farm line switching rate from 25 to 50 cents per month.

January 5: Hearing on application of the Lincoln Telephone & Telegraph Co., for permission to increase its farm line switching rate at Syracuse from 30 to 50 cents per month.

January 6: Hearing on application of the Glenville Telephone Co. for permission to establish a ten-cent toll rate applicable to non-subscribers for service between Blue Hill and Pauline.

NEW YORK.

December: The commission approved seven agreements between the New York Telephone Co. and the Eastern Pennsylvanian Power Co., involving the joint ownership and use of poles in Morris county; also five agreements between the New York Telephone Co. and the Willsboro Electric Power Co. for the use of poles in Morris and Sussex counties.

December 28: The commission held a hearing in the matter of recommendations which it has made to the Western Sullivan Telephone & Telegraph Co.

OHIO.

December: Application filed by the Farmers Mutual Telephone Co. for a certificate of public convenience and necessity for the operation of a telephone exchange in Cardington, Ohio, in competition with the Morrow County Telephone Co. and the Beech Telephone Co.

December 17: Protest filed by the Cleveland Telephone Co. against the tentative valuation placed upon its property by the commission.

January 27: Hearing of protest of the Lima Telephone & Telegraph Co., against the tentative valuation recently placed upon its plant by the commission. The company charges that the commission's experts in valuing the property 8 to 10 per cent. lower than did the company, have undervalued certain factors that enter into the appraisement.

OKLAHOMA.

January 10: Continued hearing on the complaint of subscribers of the Pioneer Telephone & Telegraph Co. at Ardmore, Okla. At a previous hearing the commission gave the company 30 days within which to improve service before proceeding upon the complaint.

WASHINGTON.

January 24: Hearing on state-wide investigation of the Pacific Telephone & Telegraph Co. with a view to determining the reasonableness of the company's rates, both local and long distance. At this hearing the figures obtained by the commission's field engineers during the past year will be used together with the company's figures in an effort to determine the fair value of the plant.

WISCONSIN.

December: The commission authorized the Lebanon Telephone Co., of Lebanon and Clyman, to substitute for the present method of payment to the Wisconsin Telephone Co. for service through the Watertown exchange a payment of three cents per call for each message from the Labanon exchange through the Watertown exchange and vice versa. The commission dismissed the company's application for an increase in rural rates.

December 22: The commission found that the Mineral Point (Wis.) Telephone Co. has an action in law and in equity against the Dukes Prairie Telephone Co., the Mineral Point & Jonesdale Telephone Co. and the Iowa & Lafayette Telephone Co.—three farmer lines which were formerly connected with the Mineral Point Telephone Co. but are now operating an independent exchange.

December 28: The commission dismissed the complaint against the Beloit (Wis.) Telephone Co., alleging violation of the anti-duplication law. This company had extended its lines into a territory served by the Rock County Telephone Co. After a hearing the commission found that this was merely a technical violation of law and that had the application been made in the regular way, it would have permitted the extension in the first instance.

"Telephony's" Home Study Course for Telephone Men

A Complete Presentation of the Principles Underlying Modern Telephony in All Its Branches—Arranged Systematically So That Regular Reading and Faithful Study Will Qualify Ambitious Men for Higher Positions—Prepared Under Supervision of Stanley R. Edwards—This Section Written by Jay G. Mitchell

Quiz Questions on the Preceding Installment.

267. Make the diagram of a relay having six springs in two sets or poles in each of which the lever spring makes contact with one spring and breaks contact with another.

268. Compare, as to operating advantages, the form of relay shown in Figs. 111 and 112.

269. What is the law governing the action of a mass of iron, free to move, placed in a magnetic field?

270. What difference exists between the coils of relays for use on continuous direct currents and those designed for operation on interrupted or pulsating currents?

271. What features in design give a quick-acting relay?

CHAPTER XIII. Direct Current Relays (Continued).

272. *The need for a slow-acting or sluggish relay.*—While the use of mechanical or so-called automatic switches in telephone switching has made essential the production of a quick-acting relay to respond to the short impulses of current used to drive the switches, it has also created a need for a type of relay which, when once energized by an impulse of current, will continue to retain its armature in the operated condition during a more or less extended withdrawal of the energizing current. Such a relay would be required, for illustration, in those parts of the circuit where it is necessary to retain the relay armature in an operated condition during the continuance of a series of short, detached, switch driving, current impulses.

273. *Principle of slow-acting relay.*—The principle upon which the design of all slow-acting relays depends, is that of electromagnetic induction. In the case of the induction coil a variation in the strength of an existing flow of current, or the interruption, or creation of a current in the primary winding, results in the production of an induced e. m. f. or voltage in the secondary winding. (See TELEPHONY, April 3, 1915, Home Study Course, Sections Nos. 77, 78, 79.) Should the external circuit of the secondary winding happen at the moment to be complete, a current would flow through it under the pressure of the induced e. m. f. or voltage.

It will be remembered that an induced current always flows in such a direction as to *oppose* the change of magnetic condition that created it. This principle is employed by placing upon and around the core of the relay, in addition to the usual winding, a copper sleeve or slug. This copper sleeve or slug in reality constitutes a secondary *winding* around the core of very low resistance and having but *one turn.*

274. *Purpose of the copper sleeve or slug of slow-acting relay.*—Whenever any disturbance takes place in the current flowing in the relay winding, there is a corresponding variation in the magnetic condition of the relay core, frame, and armature. When the current flowing in the relay winding is interrupted, the magnetic flux through the core, frame, and armature is abruptly withdrawn and an induced current created in the copper sleeve or slug. Since the copper sleeve or slug is, in one way, a secondary winding having but one turn, the voltage of such an induced current is very low. Owing, however, to the extremely low resistance offered by the circuit through the copper slug and around the core, the current produced in it by the low induced voltage, is very strong. In fact, the ampere turns of the copper slug and its induced current are sufficiently great to insure that the armature will be retained in the operated position after the energizing current has ceased to flow in the relay winding.

This is true only because the direction of any induced current is always such as will oppose the change which created it. Therefore, in the case of the slug on the core of the sluggish relay, the induced current flows around the core in such a direction as will serve to maintain the magnetic flux through it when the exciting current has been entirely withdrawn. By maintaining this flux for a short time, the restoration of the relay armature to normal is delayed by the magnetic attraction of the core and the relay is slow in action.

The e. m. f. or voltage of the current in the copper slug of the sluggish relay, like the e. m. f. of any induction in a coil, will be proportional to the rate of withdrawal or insertion of the magnetic lines of force. But the reluctance of the relay magnetic circuit is greater when the armature is in the normal position than when it is in the operated position. Since this is true, the same number of ampere turns will not produce the same *change* in the magnetic condition of the relay when the armature is in one condition as would be the case when it is in the other. The induced currents in the copper slug around the core will be stronger, therefore, when a magnetic change takes place in the core with the armature in the operated position. This means that the relay will always be slower to release its armature than it would be to pull it up from the normal position.

275. *Retarding effect of copper sleeve of relay on release and pull up.*—In actual practice the difference between the retarding effect of the slug on release and on pull up, is very marked. The mass of the slug—that is, its sectional area times its length—governs its resistance, considering it as a coil of one turn. Within reasonable limits, therefore, it is possible to increase the amount of sluggishness of a relay, working under any given set of conditions, by increasing the size of the copper sleeve or slug. It is possible by careful design in this way to produce relays only slightly slower than ordinary, as well as relays that will retain their armatures for a second or two after the cur-

rent in the winding has been interrupted. The magnetic hold of such a relay upon its armature after the withdrawal of the energizing current is by no means weak and uncertain. It is, on the contrary, very strong and positive.

In Fig. 114-*A* is shown such a relay in principle. The armature, *A*, and pole, *B*, are the same as corresponding parts in ordinary relays. The copper slug is placed at the armature end of the core. This is because it is desirable to confine all the magnetic lines of force produced by the induced currents in the slug, to the air gap and armature where they will be effective in preserving the magnetic attraction between the core and the armature. If the slug were placed at the rear end of the core, it is possible that a part of the magnetic lines of force created in the core by the induced currents might leak across the space between the core and the return part of the iron frame without passing through the armature. The useful effect of such magnetic lines of force would then be lost in so far as helping to retain the relay armature in the operated position.

Another structure of the sluggish relay in which a copper sleeve over the entire length of the core is used, is shown in Fig. 114-*B*. There are some advantages in this method from a manufacturing standpoint. It has the disadvantage, however, of failing to give any external indication as to the sluggish character of the relay. On the other hand, the slug in Fig. 114-*A* is always plainly visible.

276. *Example of action of sluggish relay.*—Suppose that a relay like that illustrated in Fig. 115, is equipped with a copper slug in order to render its action slow. If the energizing current should flow through the coil in the direction indicated, it would create a south or negative magnetic pole at the end of the core facing the observer. In other words, the magnetic lines of force might be said to enter at the front end of the core, follow the core to the rear and return through the frame.

When the current in the winding is interrupted, the existing magnetic flux through the core is withdrawn. The *withdrawal*, however, of the existing flux will produce an induced current around the core in the copper slug in the same direction as would the insertion of the magnetic lines of force in an unexcited iron core in the *opposite* direction. The inductive effect of withdrawing the existing flux in any circuit is the same as

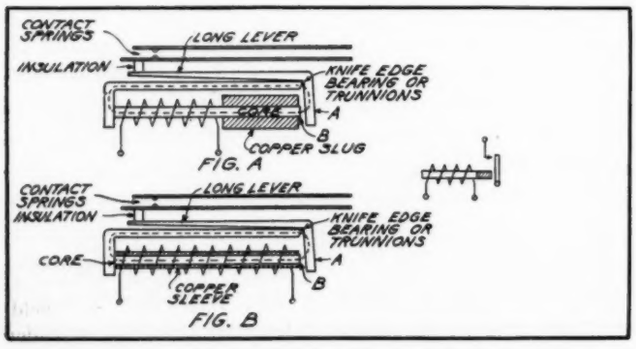


Fig. 114. Principle of the Slow-Acting Relay.

the effect of building up the lines of force at the same rate in the opposite direction.

The interruption of the exciting current flowing, as shown in Fig. 115, is equivalent, in inductive effect, to building up a magnetic north pole at the forward end of the core. This is the same as inserting the magnetic lines of force through the slug from back to front.

277. *Effect of induced currents in a sluggish relay.*—By an application of Fleming's rule (TELEPHONY's Home Study Course for Telephone Men, Section No. 78), assuming that the slug is

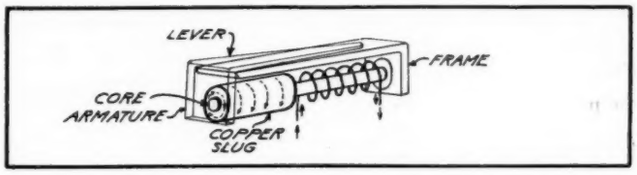


Fig. 115. Relation Between Induced and Energizing Currents.

passed over the lines instead of the lines through the slug, it may be easily seen that the induced currents will circulate, as shown by the dotted arrows, around the core through the slug in the same direction as the hands of a clock. Therefore, the *induced* currents will also produce a negative or south magnetic pole at the front end of the core. In other words, the induced currents in the slug will have the effect, after the current is withdrawn, of preserving the magnetic flux originally created by the relay winding. Since the armature is already in the operated position, the final effect will be found in the survival of the magnetic attraction between the armature and core after the energizing current has ceased to flow.

It is to be noted that the currents induced by a withdrawal of the current from the coil, flow around the core in the same direction as the original energizing currents. When the energizing current is first sent through the winding, it may be easily seen by a similar course of reasoning that the induced currents will oppose the building up of *any* magnetic flux in the core.

278. *Effect produced by copper relay slug when current is started in the winding.*—Assume, for instance, that no current is flowing in the relay winding, Fig. 115, and that the circuit is closed, causing the flow of current to begin in the coil. As the current increases in strength around the core in the direction of the arrows, its effect is to build up a magnetic south or negative pole at the forward end of the core and a magnetic north pole at the rear end. Still conceiving of the slug as a coil of very low resistance and of one turn, it may be shown that the insertion of the magnetic lines of force through it in this direction, is exactly equivalent to the effect of withdrawing the slug from the end of the core through an existing magnetic field.

By Fleming's rule, it may be seen that the induced currents in the slug under these conditions, will be in a direction *opposite* to the newly started currents in the winding. Hence the effect of the slug currents, as in the case of the breaking of the current in the coil, is opposed to the effect of the coil currents.

279. *Why slow-acting relay is slower on release than on pull up.*—When the current in the coil is *started*, the relay armature is in its normal or inoperated position. The air gap is at its greatest length and the reluctance of the magnetic circuit is also at its highest value. For the same strength of current in the windings, therefore, the magnetic flux will not be as great as it would be after the armature assumes its operated position. The number of magnetic lines of force inserted into the slug, is, in other words, less than the number withdrawn from it in the same time when the existing operating current in the coil

is broken. Since this is so, the induced currents in the slug are *weaker* and their retarding effect on the operation of the relay is not so pronounced.

It is for this reason that any given slow-acting relay is much slower on release than on pull up. Comparison of the effect of the copper slug and the reasons therefore, with the subject of eddy currents (TELEPHONY, May 22, 1915, Home Study Course for Telephone Men, Section No. 119) will serve to fix the principles involved more firmly in mind.

(To be Continued)

Pennsylvania Railroad to Install Telephones.

Permission has been received by the officials of the Pennsylvania Railroad Co.'s northwest system to install telephones for use in dispatching in the place of the telegraph instruments now in use. The telegraph instruments will be retained to transmit business messages and to serve in emergencies, but the majority of the work will be done by telephone.

The installation of the instruments on the western division will be in charge of Division Operator H. B. Reynolds, and the cost for the work between Crestline and Clarke, Ind., alone, it is reported, will be $100,000. A like amount will be spent on the eastern division between Pittsburgh and Crestline and the Chicago terminal division between Clarke and Chicago, making the total $200,000.

Two pairs of wires, or four lines, will connect Chicago and Pittsburgh. Two wires for local transmission will also be placed in service in this division, between Crestline and Middlepoint, Ohio; Middlepoint and Larwill, Ind., and Larwill and Chicago.

Telephones will be placed at every signal station, which are 5,000 feet apart, so that the trainmen will have to walk at the most only half a mile, and probably less, to get in touch with the dispatcher's office if the engine breaks down or some other trouble is encountered. The telephones will be installed on the northwest system only at the present, although their use may be extended to the central and southwest systems in the near future.

Improving the Efficiency of Long Distance Service

Increasing Capacity of Circuits Through Automatic Equipment—Giving Publicity to Long Distance—Campaign of Education in Connection with Operating Rules of Ohio State Company—Paper Presented at Convention of Ohio Independent Telephone Association

By J. C. Boush

This time a year ago the Ohio State Telephone Co. was just commencing to forge ahead with the outside construction and there has been no cessation in the activities until about two months ago. At that time the greater portion of the outside construction was completed, but we are still putting up more or less new circuits here and there.

From August 1, 1914, up to the present time it has completed and placed in service, 1,822 circuit miles of No. 10 copper wire and phantom circuits equivalent to 267 circuit miles, a total of 2,089 circuit miles. This is an increase of 12.3 per cent. of the total circuit mileage prior to August 1, 1914.

During the construction period, no time was lost on the maintenance work; large and well equipped gangs, in addition to the regular station linemen, were busily engaged trimming trees, and making extensive repairs. Other notable improvements made, which have had a telling effect, were in the transmission between quite a number of places. The company has devoted considerable time and attention to this all important question and is still very aggressively pursuing the work.

It is astonishing the transmission losses that take place at most stations, due to antiquated equipment in the central offices, faulty design of switchboard circuits, exceptionally high resistance in subscribers' loop, etc., a good portion of which I find can be corrected at a comparatively small cost. Experience has taught us that there is more behind this transmission question than we ever realized.

INCREASING LOAD CAPACITY OF CIRCUITS.

The Ohio State company is taking another step toward increasing its circuit loads to a higher percentage of capacity between some stations by means of automatic equipment. For experimental purposes this is being installed at Thompsons Corners and Cleveland. We are so thoroughly convinced that its functions will come up to what we anticipate that I believe we can count on it becoming a permanent arrangement. For the benefit of those who may not be familiar with this new scheme I will briefly state its purpose.

With the equipment at Thompsons Corners, it will permit stations, which have direct lines to Thompsons, to automatically select certain lines radiating from that station which are now connected up manually, and where such lines terminate at an automatic plant like Akron, to select the subscriber's line at that station automatically. For certain stations that have direct lines to Cleveland, it is to be arranged so they can call the places of business in Cleveland automatically with which they have any volume of traffic.

During the year we have about doubled our force of long distance solicitors who cover the state to incite interest in our long distance service. From the reports received, it impresses me that the sentiment is steadily growing in our favor.

ADVERTISING LONG DISTANCE SERVICE.

We have been doing more or less advertising in the newspapers; conspicuous advertisements have been appearing in telephone directories. We have been passing around and mailing out in correspondence, hand blotters, etc., all of which I think have had their effect.

A routine book which will be of great value to your operators in connection with handling the traffic is now in preparation. The process of collecting and compiling the information has been rather slow for the reason that there is so much detail work involved, but we are trying to hasten the work as much as we possibly can.

We have made very substantial progress in our traffic work since the new book of operating rules was placed in effect last July. During the latter part of June a campaign of education was started by holding operators' schools of instructions at Columbus, Dayton, Lima, Toledo, Sandusky, Mansfield, Cleveland, Youngstown, Canton, Zanesville and Athens under the leadership of W. S. Vivian. These proved to be one of the most interesting features of our work.

The pleasing expressions of satisfaction on the part of the companies attending these meetings lead us to believe that they have a far-reaching effect. While they stimulated enthusiasm beyond a measure, and while a greater majority profited by the meetings, nevertheless we cannot let it rest at that and expect the operating forces to carefully observe these rules, for the reason they are lengthy and many ideas were

introduced on up to date operating which are foreign to the majority, especially those at the smaller offices.

Duties and Value of Traveling Chief Operator.

To help along and produce increased action in this traffic work, we have recently started out a number of traveling chief operators. Their duty shall be to keep visiting the various offices and assist the operators with these rules all they possibly can. We want them to be a real help to the companies. After these traveling chief operators get the operators to meet with them, we can create the same influence and deep concern that always manifests itself wherever these gatherings are held.

It is my sincere belief that a majority of operators are commencing to realize more fully than any time before that larger opportunities will call for large capabilities. There is every evidence to substantiate this in the manner which they are interesting themselves in these rules after they once begin to appreciate the merits.

This traffic work has been responsible for reducing the number of lost calls quite perceptibly. It is found at many offices that a call for service nowadays is regarded by the operators with the greatest respect and, as a rule, a good reason is usually assigned if a call is cancelled. It is gratifying to know the effort that is made by many to revive cancelled calls on the following day. Some figures, handed me from time to time by officers other than our own, as to the number of calls revived during a month and the amount of revenue represented are really amazing. All of this used to be considered as a secondary matter or possibly ignored entirely. Those who have never followed this plan to increase the traffic, are advised to try it and note how quickly the turning point will be observed.

Sizing up our efforts so far as we have gone with this work, it strikes me as though a new wave of interest had drifted over the Independent field which naturally makes the operating forces feel as though the current is no longer set against them.

It is pleasing to know the recognition our long distance operating rules are receiving outside of Ohio. The Western Pennsylvania Independent Telephone Association whose membership includes about all of the operating companies in Western Pennsylvania and Western New York, adopted the same book of rules on July 25, 1915. Since that time it has started a similar campaign of education under the guidance of W. H. Hay, service engineer. From reports received since the work started, the operators in that territory are becoming seemingly well inoculated with these rules. The Michigan traffic association endorsed the rules at its last directors' meeting. Its field work is being very ably directed and conducted by F. V. Newman. The work done by these two associations toward arousing the traffic forces and sending them into a whirl of activity in their respective territories, is highly commendable.

The spirit has also drifted into Indiana and I feel safe in saying that it will only be a matter of time until that state will be abreast with the others. It is my opinion the day is not far distant when the Independent companies will have a uniform system of operating methods, not only in all of the Middle West states but others included.

The manner in which this traffic work has kindled the inspiration of the many operators and the glancing remarks made by quite a number, naturally makes one feel as though they had been neglected in different ways during the past. No doubt the plant and more or less of the commercial side of the telephone business, have held the center of the stage for such a long time and so completely outshadowed the traffic work that a great many of the managers have lost sight of the importance of it.

It is interesting, indeed, to observe the good bargain a manager tries to obtain before buying equipment and supplies—the careful scrutiny each invoice receives before approving it. All of this is decidedly proper, but have you ever paused to think that the selling of your service is just as important as the buying? Let us bear in mind, please, there is no more trim and usable word in our business than "service."

The word service brings me back to this timely quotation: "Business is sensitive—it only goes where it is invited and stays only where it is well treated." This well known truth, or moral precept, may be ancient to many, but it impresses me as being one of the finest object lessons of which I know. If the service the operator delivers is good, it will invite the business and earn a kindly reception for the company. If the service is faulty, business will soon become discouraged and go elsewhere.

I am afraid one of the weaknesses has been that the manager has been so deeply engrossed in his plant duties that he takes it for granted the chief operator and her forces are capable of solving their own problems. They can possibly do fairly well, but I sincerely believe if the operating force was brought together occasionally for the purpose of exchanging ideas and offering words of encouragement and advice, you would soon find yourself surrounded by a different atmosphere. You cannot pick up a telephone magazine which does not drip with ideas about engineering and the upkeep of the plant, also how the time-worn question of depreciation should be treated and many other problems all of which are important, but how about the operators' side? Wouldn't it be well to have more appear in print about their work so it would encourage them to create a better and more permanent interest in their duties?

The operating men hold district meetings as a rule, and each year have their annual convention, all of which add immensely for the betterment of the cause. But why not let the chief operators hold similar gatherings some time so as to permit them to talk about their problems and give them an opportunity to discuss new ideas. I believe it is about time we give them a few innings or, at least, recognize that they and their forces are the dashing business getters of the organization.

You may be inclined to feel that I am trying to hang too many laurels on the brow of the operator, but when I commence to check up and find how lamentably weak the operating companies have been with respect to appreciating more fully what this traffic work really means, and possibly looking upon the operator as nothing more than a mere figure on the traffic sky line instead of a part of the real works, I commence to blush.

What I am reaching after is to try to do more toward increasing the operator's respect for her position, and her knowledge of how to handle her work in a less perfunctory and a more positive way. We want to cut loose and disseminate the elements which help to make the work more inviting and desirable and to sharpen the appetite of the operators for better service. As Bill Nye once said: "The best way to find out is to ascertain," and I have been doing a reasonable amount of ascertaining on this question to convince myself that my thoughts are in the right direction.

Fire in Telephone Exchange at Titusville, Pa.

Just as the troublemen, on December 17, were congratulating themselves upon the small amount of trouble and anticipating an easy time through the holidays, a cry of fire rang through the Titusville exchange of the Petroleum Telephone Co.

Fortunately, no one was seriously injured, and the fire was confined entirely to the cable riser. While service was completely cut off, restoration was started almost before the wires became cool. J. R. Campbell, a splicer in charge of underground installation, was severely burned about the face and hands in his efforts to remove a pot of burning paraffine, the cause of the catastrophe.

Through the prompt efforts of the company's employes with hand extinguishers, assisted by the local fire depart-

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The efficiency and reliability of relays has been proven in every modern telephone system, whether manual or automatic.

The RELAY AUTOMATIC TELEPHONE SYSTEM uses relays only for all operations and offers a method whereby

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Please tell the Advertiser you saw his Advertisement in TELEPHONY.

ment, a fire that bore all the earmarks of a dangerous blaze, was soon subdued.

F. Falkenstein, the local manager, was, through the courtesy of the Bell company, enabled to notify W. S. Paca, of Oil City, general manager of the company, and immediately thereafter started to renew toll line service. Mr. Paca arrived in Titusville with a force of men in a few hours and the work of restoration was taken up in earnest.

By that night all toll service had been in operation several hours and all telephones on the east and south sides of the city were enjoying service as usual. Both Erie and Meadville assisted by sending cable splicers, and the fact that all the 1,620 telephones were working under normal conditions by Sunday night speaks well for the conscientious efforts of all concerned.

The Petroleum Telephone Co. operates in Oil City, Franklin, Titusville and Pleasantville and has in service a total of 7,000 telephones. It has a qualified toll contract with the Bell company which gives it toll connections over all Bell lines.

From Factory and Salesroom

Conventions: Illinois, Springfield, January 18-20; Minnesota, Minneapolis, January 25-26; Wisconsin, Madison, February 9-11; Kansas, Topeka, February 15-17

J. B. Edwards, New President of Kellogg Company.

At the regular monthly meeting of the board of directors of the Kellogg Switchboard & Supply Co., Chicago, J. B. Edwards, under whose personal direction and effort the Kellogg company has made such important and significant growth in the past ten years, was made president, continuing, of course, as general manager.

L. D. Kellogg, the retiring president, whose efforts in

J. B. Edwards. L. D. Kellogg.

the cause of Independent telephony have been a great factor in the success of the company, was elected chairman of the board of directors.

The other officers remain the same, J. G. Kellogg being re-elected vice-president and Seymour Guthrie, secretary and treasurer.

Class C Accounting.

Much has been said and written to Class C telephone companies about the importance of adopting the uniform system of accounts prescribed by the Interstate Commerce Commission. But nothing will emphasize so effectively the necessity of immediate action in this direction as the order for the first annual report, when it is issued. C. A. Bennet, of Kansas City, Mo., auditor of the Gary System, in an address at the recent Missouri convention, said that companies will be called upon before March 31, 1916, to make a report and that no excuses will be accepted.

The Telephone Printing Co., of Defiance, Ohio, in a circular to the Class C companies seeks to impress upon the telephone companies the importance of immediately installing a system of accounting such as was devised by the expert government accountants. The Telephone Printing Co. is publishing all of the books, blanks, and forms so devised, and claims the advantage of publishing the books in both loose leaf and round form. Many companies installed the system in January, 1915, but many others delayed and have been exerting every effort to get the system in working shape by the first of this year.

Bell Lumber Co. to Get Timber from Indian Reservation.

The Bell Lumber Co., of Minneapolis, Minn., was recently awarded the cedar on all of the tribal lands on the Odahah Indian Reservation on its bid to the Indian department, following the publication of an advertisement requesting bids.

The company had already secured all of the other timber on this reservation three years ago. As this tribal timber covers a number of years' operation, taken together with the Bell company's previous holdings on the reservation and at other points, it insures the lumber company timber for white cedar pole operations for at least ten to twelve years to come.

Operation of camps on the reservation and at other points producing poles have already been started by the Bell Lumber Co. to supply its next spring and summer trade.

Cracraft, Leich Switchboard Orders.

Cracraft, Leich Electric Co., of Genoa, Ill., has been awarded the contract to furnish the fire alarm department of the city of St. Paul, Minn., a special two-position desk type switchboard.

Instructions to all fire stations in the city will be given through this board and all still or telephone alarms will be received on it. It will also be used for the communication and transaction of ordinary business between the various fire stations.

Several special features, such as the grouping of a number of lines so that all stations in any particular group may be called and talked to simultaneously, will be incorporated in the board.

The Cracraft, Leich company has also closed a contract with the Whitley County Telephone Co., Cambridge City, Ind., for a new switchboard of the electrically restored drop type for its South Whitley exchange.

Kellogg Exhibit at South Dakota Convention.

Considering the sleet and threatening weather, the convention of the South Dakota Independent Telephone Association, held at Sioux Falls, December 15 and 16, had a good attendance.

One of the most attractive features of the convention was the Kellogg Switchboard & Supply Co.'s instantaneous recall switchboard, which is known for its time and money-saving advantages in more than 30 installations.

Are You Interested In The Subject of MOTOR TRUCKS?

WILL you please write to our Motor Truck Department and advise if you are interested in MOTOR TRUCKS? The information which will be furnished will not be obligating in any way and it might prove very interesting and profitable to you.

Please let us know if you are using horses and wagons *now* and state *how many?* What does it cost you for up-keep per month? How many men comprise your construction crew?

IT is also important that you advise the extent of your territory in miles. Have you any motor trucks in service *now?* If so, please state the make; also *number.*

Would you like to have our motor truck department advise you about the equipment furnished with motor trucks for pulling aerial cable and wires; for setting and resetting poles? Are you familiar with *"The Winch and Drum?"* Will you let us tell you how "increased working efficiency" and "reduced expenses" can be achieved by using motor trucks?

Please Answer Above Questions Fully

Address The Motor Truck Department

Telephony Publishing Company

53 West Jackson Blvd. **Chicago, Illinois**

The Kellogg company's complete exhibit included display panels of all the latest type telephones and apparatus.

November Earnings of Ohio State Show Increase.

Earnings of the Ohio State Telephone Co., Columbus, for November marked a gain of more than $10,000 over the previous month. This was the seventh consecutive month in which gains were recorded over the preceding month. The gross earnings amounted to $288,519, as against $278,125 for October, and $275,652 for September.

Expenses, including taxes and insurance, in November were $169,073, producing a net income of $119,446. Deduction of fixed charges—interest on bonds—amounting to $46,484, left net earnings for the month of $72,961. After paying the preferred stock dividends, $46,873 was left as a surplus available for depreciation, financial requirements of the company and common stock dividends.

Sales Meeting of Garford Mfg. Co.

The annual sales meeting of the Garford Mfg. Co. was held this week at Elyria, Ohio, with about 30 of its traveling representatives participating. The purpose of this annual "get-together" meeting is to give the company's salesmen an opportunity of discussing new equipment, new sales plans and ideas in starting out the new year's business.

Telephone Growth at Ithaca, N. Y.

That the Federal Telephone & Telegraph Co. is making rapid growth in Ithaca, N. Y., under the management of Eugene Kemp, is evidenced by the fact that that city has three times won the cup offered by the company for increase in business. The cup now remains in permanent possession of the Ithaca office. Winning the cup three times in succession places the office on the honor roll, and makes the operators eligible to the profit-sharing plan of the company.

This increase in business is in long distance work, and means a 10 per cent. increase over the 10 per cent. natural increase expected of the office.

Plans for New Detroit Exchange of Bell Company.

The Michigan State Telephone Co. has completed plans for the erection of a new exchange building to provide more commodious quarters to take care of the future business of the East exchange. The present exchange was opened in 1904 with facilities then thought to be sufficient for many years.

The new exchange will cover a ground area of 43 by 105 feet and will be three stories high, with provision made for the addition of another story, if necessary. The plans for the structure call for a frame of steel and concrete with an exterior of red pressed brick, trimmed with white stone. The new exchange when completed will have a capacity for 12,000 stations. The capacity of the present East exchange is 8,500.

Mineral Point (Wis.) Company Has Action in Law.

The Wisconsin Railroad Commission, at a hearing held last week, found that the Mineral Point Telephone Co. has an action in law and in equity against the Dukes Prairie Telephone Co., the Mineral Point & Jonesdale Telephone Co., and the Iowa & La Fayette Telephone Co., three farmer lines which were formerly connected with the Mineral Point Telephone Co., but are now operating an independent exchange. In the decision the commission points out that the illegal exchange might be abated by an action through the attorney-general's department. It points out that the more feasible way would be to abate the farmers' exchange by action in the local courts.

Heroic Efforts of Operator to Save Building from Fire.

J. H. Young, night telephone operator at the Texas Traction Co.'s substation north of Sherman, Texas, made a heroic effort to save the building, which was set on fire when a 33,000-volt high-tension wire broke and fell on the telephone wires. Mr. Young cut four of the six wires which were crossed by the traction cable with a pistol, but was unable to cut the other two until the fire was out.

Use of either of the telephone lines which were crossed would have meant instant death to the user. They were disconnected after Young had walked to a farmhouse and warned the Sherman telephone office of the danger.

New Home of Douglas Telephone Co., Homer, Ill.

The Douglas Telephone Co., of which Charles Davis is manager, recently moved into its new exchange at Homer, Ill. The building is a one-story structure of pressed brick construction. The entrance leads into a large hall, at the end of which are the long-distance booths. To the right is the manager's office and adjacent to this room is the operating room. In the rear is a large storeroom and work room with concrete floor.

Placing Telephone Wires Underground.

The New York Telephone Co. is spending approximately $40,000 in placing its wires in the business section of Cohoes, N. Y., in underground cable. A new pole line has been constructed in Columbia street and arrangements for a joint use of poles with the Cohoes Gas & Light Co. along certain streets have been completed by the telephone company.

Condensed News Reports

Officers of Companies Are Urgently Requested to Forward to Us Promptly All Financial and Other Statements as Soon as Issued and Any Items of Interest as to Their Plants and Systems

Personal.

LOUIS CONNELLY, manager of the La Porte Telephone Co., at Westville, Ind., resigned recently to accept a position at La Porte.

GLENN BRIGGS, manager of the Gregory, S. D., exchange of the Nebraska Telephone Co., has resigned to engage in the grocery business at Norfolk, Neb.

CHARLES M. SICKLES, formerly manager of the Oxnard Home Telephone Co., Oxnard, Cal., has been made superintendent of the Colusa County Telephone Co., with headquarters at Colusa, Cal.

M. H. EDWARDS, cashier of the Cumberland Telephone & Telegraph Co., at Meridian, Miss., has been appointed manager of the Lake Charles, La., exchange of the company, succeeding V. Biard, who has been promoted to the district managership at Hattiesburg, Miss.

WARREN E. HATTON, foreman of the Cumberland Telephone & Telegraph Co. at Mt. Sterling, Ky., for several years, has been appointed manager of that exchange to succeed C. T. Chatham, who has been promoted to a position in Florida.

Obituary.

CALVIN B. BURCH, vice-president and general manager of the Union Telephone Co., of Sidney, N. Y., died recently at his home in Sidney after an illness of several months.

New Companies and Incorporations.

GLASGOW, MONTANA.—The Four Valleys Telephone Co. was recently organized with a capital stock of $400,000. The incorporators are C. E. Alsop, H. A. Yotter, T. R. Jones, W. B. Shoemaker and C. V. Willis all of Glasgow.

WATFORD CITY, N. D.—The farmers near Watford City met recently and organized the Spring Creek Farmers' Telephone Co., to build a line from the Little Missouri river to Watford City, a distance of about sixteen miles. H. W. Landon was elected president; E. Sondrol, secretary, and H. Hanson, treasurer. Work on the line will begin early next spring.

HILLSDALE, N. Y.—The A. M. Johnson Telephone Corporation was incorporated recently with a capital stock of $8,500 which is divided into 850 shares at $10 each. The directors include William A. Mallery, Jr., Edmund Herrington, and John Johnson of Hillsdale and attorney, F. L. Conklin, of Millerton, N. Y.

Construction.

CHESTER, PA.—The Bell Telephone Co., has decided to make improvements in Chester that will cost approximately $80,000.

EL PASO, TEXAS.—The Tri-State Telephone Co., will erect an addition to its telephone building here and will also build a garage and machine shop.

SEGUIN, TEXAS.—The Southwestern Telegraph & Telephone Co., is making enlargements and improvements to its system here at a cost of about $12,000.

SNYDER, TEXAS.—The Southwestern Telegraph & Telephone Co., will make extensive improvements to its telephone plant in this city.

Miscellaneous.

ADVANCE, IND.—The Advance Telephone Co.'s plant was sold for $6,000 to J. M. Sandy and R. J. Riner of Advance, Indiana.

GRAYSON, KY.—The Big Sandy Telephone Exchange at this place was destroyed in a fire which swept the business portion of the town recently.

GARLAND, TEXAS.—A. D. Jackson has purchased the Garland telephone plant and exchange from W. A. Holford for $11,000. The new owner will add improvements to the service.

TRIPP, S. D.—The property of the Tripp Telephone Co. has been purchased by Henry Zeitner, C. Klein and C. Zeitner, local capitalists, who will conduct the system in the future. Henry Zeitner will act as manager.

Elections.

GENESEE, IDAHO.—The annual meeting of the stockholders of the Home Telephone Co., was held here recently and the following officers elected for the coming year: A. W. Beachler, president; John Meyer, vice-president, and Charles P. Whalen, secretary and treasurer. Other directors are as follows: J. P. Michaelson, James Tobin, Anton Borgen, D. Scharnhorst, James Nisbet and C. Lange.

FAIRVIEW, ILL.—A meeting was held recently to elect officers of the Fairview Telephone Central for the coming year. The officers elected were: President, H. C. Hill; secretary, N. A. Leigh; treasurer, Jerome Lawson.

COATESVILLE, IND.—At the annual meeting of the Coatesville Telephone Association, O. F. Lakin, C. S. Hessler, W. E. Greenlee, Fred Todd and E. McNay were elected directors.

FORT WAYNE, IND.—William L. Moellering was re-elected president and general manager of the Home Telephone & Telegraph Co., recently, at the meeting of the board of directors, which followed the nineteenth annual meeting of the stockholders. Other officers elected were: John B. Reuss, vice-president; Frank E. Bohn, secretary and assistant general manager; M. B. Fisher, treasurer.

NORTON, KANS.—The meeting for the election of officers for the Farmers' Telephone Co. was held recently. The new board of directors elected are: H. C. Beckman, president; O. D. Hershizer, secretary.

MORRICE, MICH.—The members of the Farmers' Union Telephone Co., met recently in annual session. Officers were elected as follows: President, Edward Grout; secretary, Alfred Highbee; treasurer, Edward Eddington; director, Joseph Schlichlin; manager, Bert Hoard.

ROCK PORT, MO.—At the annual meeting of the Rock Port Mutual Telephone Co., the old directors were unanimously re-elected. They are L. D. Ramsay, J. M. Sliger and Chas. Walter. Jas. Shaver and Thos. Henderson were held over as directors, their terms not having expired.

LA RUE, OHIO.—A meeting of the directors of the La Rue Telephone Co., was held recently and officers elected. C. F. Stahl, former vice-president, was elected president to succeed J. H. Leonard, deceased, and W. F. Kniffin was re-elected secretary and treasurer. L. G. Copeland was appointed by the directors to fill the unexpired term of Mr. Leonard as director of the company.

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Monarch 3-bar 1000 ohm bridging Hotel sets @ $3.75; with hinged transmitter 4.00
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